World Petroleum

MAY, 1951 FIVE DOLLARS PER YEAR • FIFTY CENTS PER COPY

THIRD WORLD PETROLEUM CONGRESS • THE HAGUE 1951 •

WARREN NATURAL

MOTOR FUEL

GREATER SPEED

HIGHER OCTANE | QUICKER STARTING

LOWER FRONT END | MORE POWER | GREATER VOLATILITY

WARREN'S *STABILIZED* NATURAL GASOLINE

NATURAL GASOLINE
Butane
Propane
Iso-Butane
Iso-Pentane
Hexane
Heptane
STA-VOL-ENE

One of the largest manufacturers and exporters of Natural Gasoline and LPG products, Warren has the experience and skill; the production, storage and shipping facilities to insure your requirements of Knockless, Carbon-Free Light Ends so necessary to a Better Motor Fuel.

WARREN PETROLEUM CORPORATION

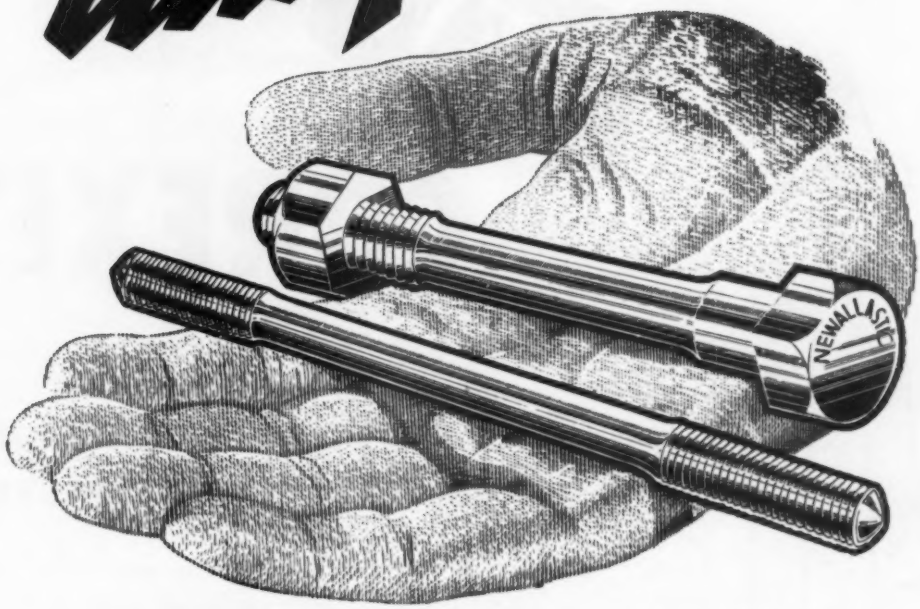
Producers, Manufacturers, Exporters and Marketers

Export Terminals: Corpus Christi, Port Arthur, Baytown, Texas City, and Norsworthy, Houston, Texas.

TULSA 2, OKLAHOMA CABLE ADDRESSES: Stavolene, Warren

Crude Oil, Natural Gasoline and Liquefied Petroleum Products

Unique



"Newallastic" bolts and studs have qualities which are absolutely unique. They have been tested by every known device, and have been proved to be stronger and more resistant to fatigue than bolts or studs made by the usual method.

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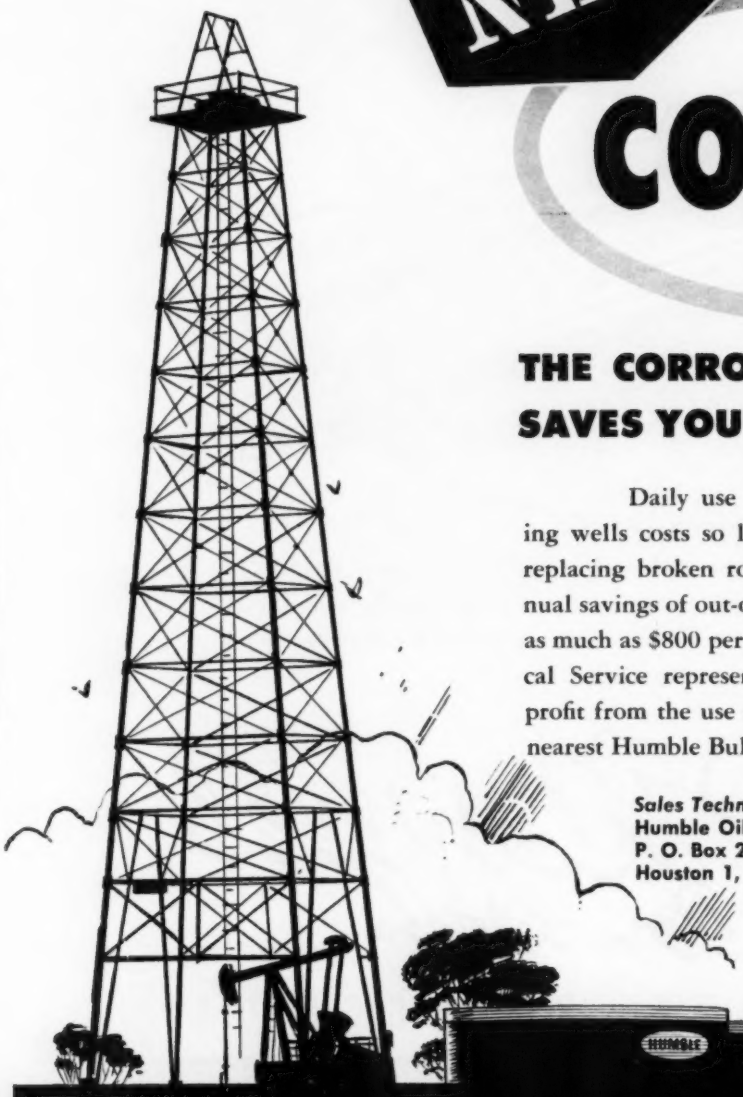
POSSILPARK GLASGOW · N

SAVES UP TO $800.
PER WELL • PER YEAR

NEW

COREXIT



THE CORROSION INHIBITOR THAT SAVES YOU MONEY, TIME, TROUBLE

Daily use of Corexit in sour crude, pumping wells costs so little compared to the expense of replacing broken rods and corroded tubing that annual savings of out-of-pocket money have amounted to as much as $800 per well. Ask a Humble Sales Technical Service representative to explain how you can profit from the use of Corexit on your lease. Call the nearest Humble Bulk Agent (in Texas) or write to:

Sales Technical Service
Humble Oil & Refining Company
P. O. Box 2180
Houston 1, Texas

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Big Inch Miles Are *BIG

*Completed since October 1950 or now under construction—
2,770 miles of large diameter pipe lines,
over 50% in foreign countries. Bechtel resources are ready
to serve you, when and wherever needed.

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*"BIG" (adj.) 20" to 34" diameter.

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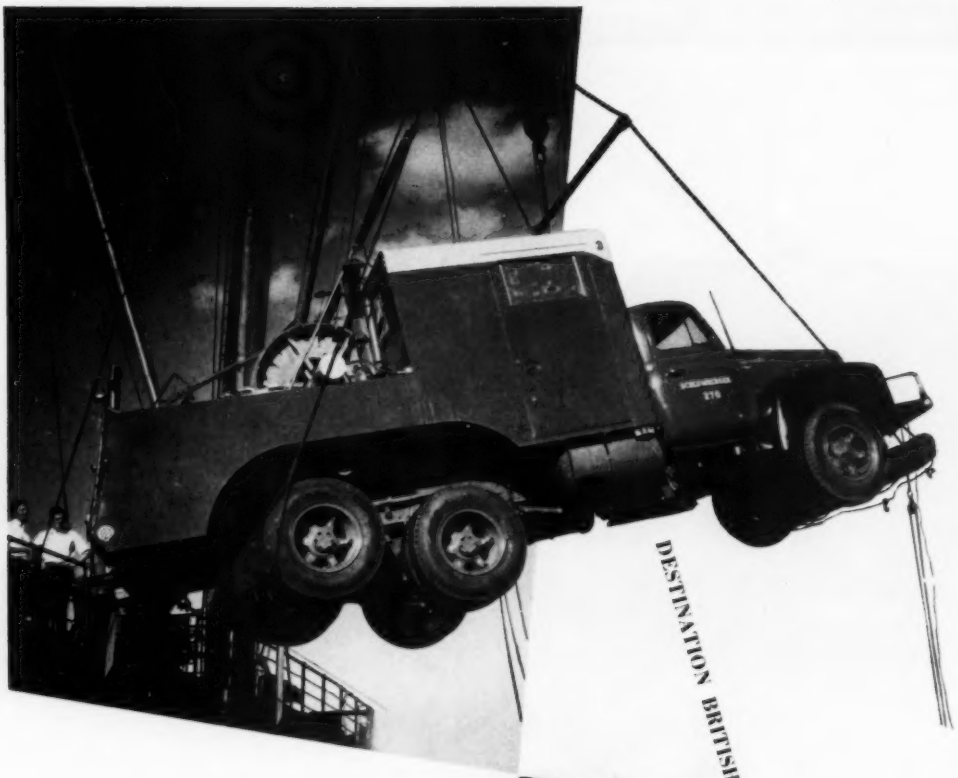
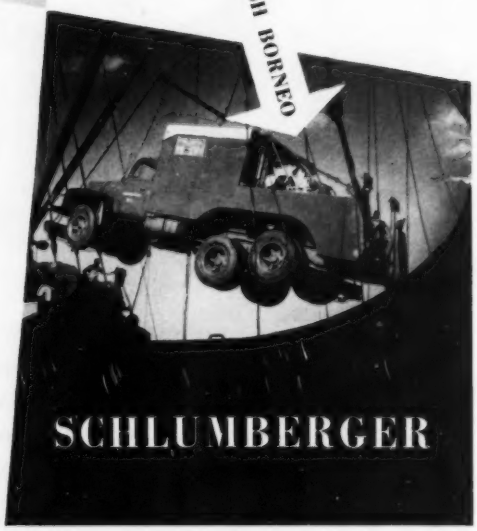
WORLD PETROLEUM for May, 1951. Vol. 22, No. 5, May, 1951. WORLD PETROLEUM is published monthly by Mona Palmer, Trustee under the will of Russell Palmer, 2 West 45th St., New York 19, N. Y. Acceptance at East Stroudsburg, Pa., under Section 34.64 P. L. & R. Authorized. Subscription rate: $5.00 per year, single copies 50c.



DESTINATION BRITISH BORNEO

Wherever
the
drill
goes
Schlumberger
goes



SCHLUMBERGER SURENCO S. A.

c/o British Malayan Petroleum Company
Seria, Brunei
British Borneo via Singapore

Six reasons why the major steel companies are using McKee Engineering Services

MEMO TO

Petroleum Refiners

● This advertisement is published here to acquaint oil men with what the McKee Iron and Steel Plant Division is doing to alleviate steel shortages.

In addition to its refinery engineering projects McKee now has in progress seven blast furnaces, two integrated steel plants, two 750,000-ton open-hearth shops and miscellaneous related projects.

1 Arthur G. McKee & Company have been recognized since 1905 as a leading engineering firm engaged in the design, engineering and construction of iron and steel plants.

2 McKee experience includes all types of iron and steel production facilities from preparation of raw materials to finished steel.

3 The McKee organization has the scope and resources to undertake any steel plant project regardless of size or location. Completion dates of new projects are contingent on present schedules.

4 McK
edge
completion

5 McK
blast
sintering p

6 Men in the Iron and Steel Industry know from long experience that the McKee method of coordinated engineering reduces plant costs and speeds completion—that ***McKee Engineering means Assured Results.*** That's why they buy McKee Engineering.

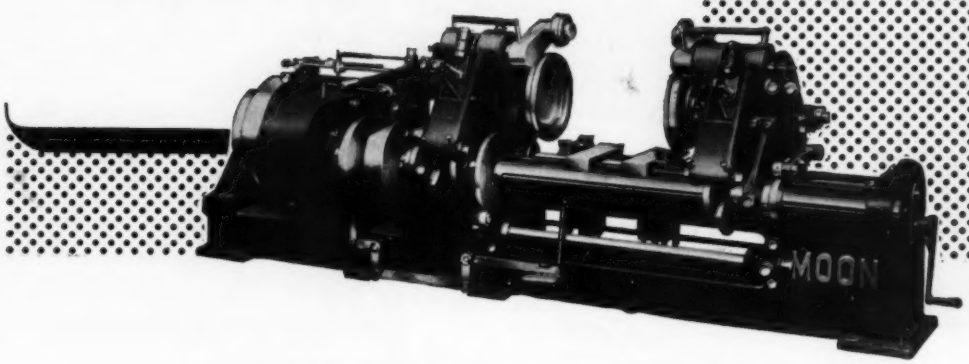
DESIGN, ENGINEERING AND CONSTRUCTION FOR THE PETROLEUM REFINING AND IRON AND STEEL INDUSTRIES

McKee Engineering

Arthur G. McKee & Company • Established 1905

Headquarters: McKee Building, 2300 Chester Avenue, Cleveland 1, Ohio. *New York:* 30 Rockefeller Plaza, New York 20, N.Y. *Tulsa:* 918 First National Bank Building, Tulsa 3, Okla. *England:* The Iron and Steel Division of Arthur G. McKee & Company, is represented by Head, Wrightson & Co., Ltd.

THE FASTEST
DOUBLE ENDED DRUM SEAMER



5 and 10 gallon drum output revolutionised!

For consistent high quality in mass producing standard small drums, this machine with its capacity of 450 drums per hour is without equal.

The machine is fitted with anti-friction bearings, semi-automatic feed and a compensating device which aligns the Seaming Rollers to the end stampings, thus tolerating any discrepancies that may occur in the guillotined bodies.

Ease of adjustment, simplicity in change over and setting, are features that contribute to the success of this Moon Machine Model Q.R.

Write for full details.

MOON

Regd Trade Mark

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MAKERS OF TIN BOX AND DRUM MAKING MACHINERY

dm MB 13

Badger can be of great assistance to you in speeding development of new products or processes from your laboratory to full commercial production.

Badger's reservoir of engineering knowledge and experience can save you months in process investigation.

Badger planning includes consideration of long range factors such as need for expansion and the effect of possible technical and economic developments.

When Badger handles all details of engineering, procurement and construction you eliminate the necessity of expanding your own organization. Badger's *single responsibility* often results in considerable savings in time and money.

When your organization must rapidly complete process facilities involving new concepts get in touch with Badger.

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REFLECTION
REFRACTION
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Southern GEOPHYSICAL COMPANY
SIDON HARRIS, PRESIDENT

Another Example of Efficient Power at Lower Cost

ON ONE OF THE WORLD'S LARGEST OPERATING CRUDE LINES..

Cooper-Bessemer LS-8 engines in Creole Petroleum Corporation's Ulé pumping station. Engines, direct-connected through a fire-wall to 8" x 24" triplex pumps, are rated 1000 bhp at 300 rpm. Rated capacity of each pumping unit is 50,000 bbl a day.

Cooper-Bessemer flexibility is Creole's gain

POWER for Creole Petroleum Corporation's big, 143-mile Ulé-Amuay line is furnished by 14 Cooper-Bessemer engines. All are modern, Type LS 8-cylinder units. This standardization naturally permits simplified operation as well as substantial economies in parts inventory and maintenance. But to achieve such standardization required engines with flexibility to operate efficiently on different type fuels.

For example, of the seven LS engines in Creole's Ulé pumping station (shown above), two are operating as gas-diesels, burning only pilot charges of fuel oil. All seven will soon be operating as gas-diesels . . . all easily switched to 100% oil, or any combination of oil and gas, at will. At the Dabajuro station, midway on the line, there are seven more LS-8's. Here these Cooper-Bessemers operate on crude from the line.

Full gas operation, 100% oil, gas-diesel, or speedy conversions from one to another . . . you'll find proved Cooper-Bessemers of the type and size you need, ready to give you the best there is in efficiency and over-all economy.

The Cooper-Bessemer Corporation

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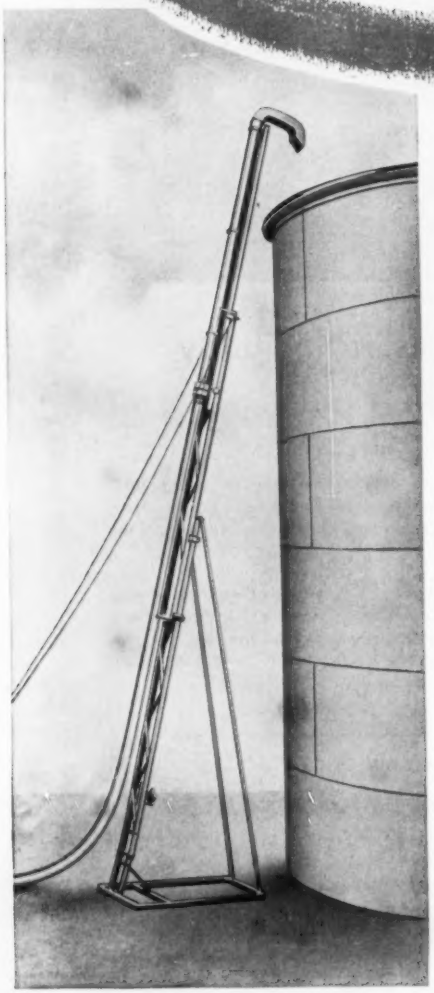
San Francisco, Calif. Houston, Dallas, Greggton, Pampa and
Odessa, Texas Seattle, Wash. Tulsa, Okla. Shreveport, La.
St. Louis, Mo. Los Angeles, Calif. Chicago, Illinois Caracas, Venezuela

Modern Fire Protection for Refineries and Tank Storage



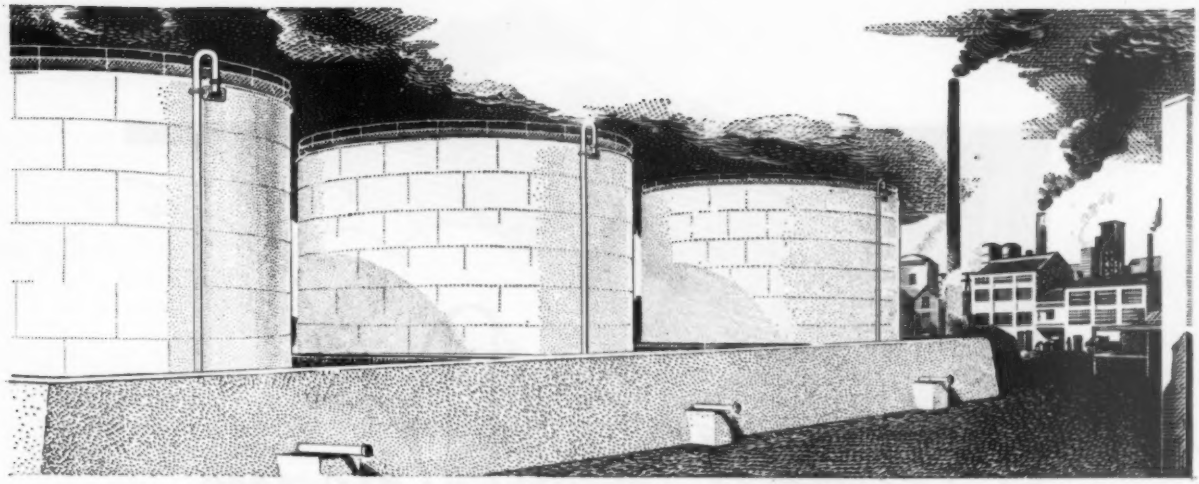
The production and processing of oil in all its various phases involves many different fire dangers, all of which can be successfully overcome with one or other of the range of "PYRENE" Fire Appliances. Some of the latest forms of Fire Fighting Equipment for dealing with Oil and Spirit fires are illustrated and described here.
Those responsible for fire safety in the Oil Industry may benefit by the experience and research of our Engineers and Chemists who will be pleased to give impartial advice on these fire problems without charge or obligation.

"PYRENE" FOAM-MAKING BRANCHPIPES. Made in several sizes producing up to 2,400 Imperial gallons of Mechanical Foam per minute, these appliances deliver foam at the end of the water line. The foam is generated within the branchpipe itself and operates on a water pressure as low as 60-lbs. per square inch. The smaller size generators may be used as portable foam units. The larger models are usually embodied in fixed installations on storage tanks.

"PYRENE" MECHANICAL FOAM GENERATORS. Also made in a range of sizes generating up to 2,400 Imperial gallons of foam. These units operate within the water line and are capable of passing foam through up to 400 ft. of fixed pipe lines or canvas fire hose. "PYRENE" Foam Compound is induced into the water head of each Foam Generator. Alternatively, specially designed inductors or Foam Proportionators may be used, particularly for the larger installations.

(LEFT) "PYRENE" PORTABLE FOAM TOWERS. In certain circumstances it is advisable to apply foam through the medium of portable towers such as that shown on the left. There are several models made in light alloy that can be extended and maneuvered into position by two men. These appliances are designed for use with either "PYRENE" Foam Branchpipes or Generators.

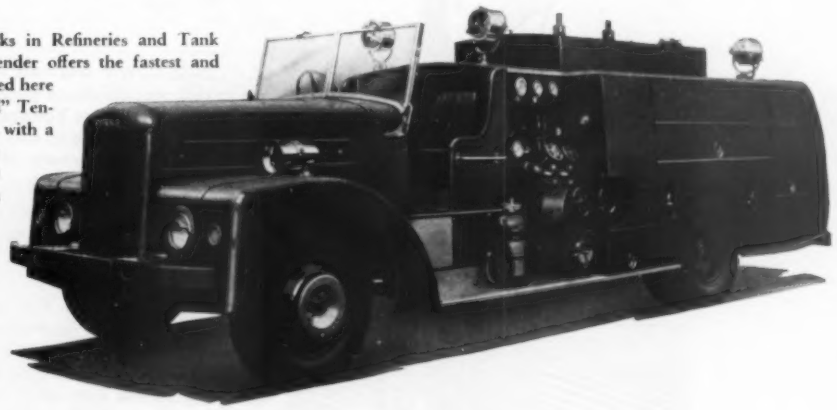
Full particulars will be forwarded on request to Dept. W.P. 5, The Pyrene Company Limited, 9, Grosvenor Gardens, London. S.W.1. England. Telephone: VICtoria 3401/2 Telegrams: "Pyrenextin" Sowest London. Cables "Pyrene London". *Associated with Pyrene Manufacturing Company, Newark, New Jersey, U.S.A.*

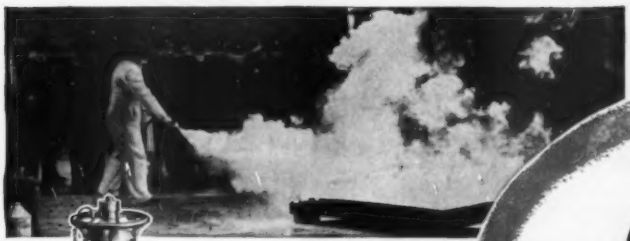


FIXED FOAM INSTALLATIONS. Complete built-in fire protection for Tank Storage Farms, providing for quick application of foam to the surfaces of burning oils or spirits, are designed and installed by our Engineers to meet all conditions. Wherever possible, foam compound is induced into the existing water supply line, thus reducing runs of pipe line to the minimum. "PYRENE" Mechanical Foam Generators, being light and portable, can be connected to a foam riser on each tank. Alternatively, foam branchpipes may be fitted as an integral part of each foam riser.

MOTOR-DRIVEN FOAM TENDERS

Where complete protection against fire risks in Refineries and Tank Farms is required, a "PYRENE" Foam Tender offers the fastest and most efficient safeguard. The tender illustrated here is one of many different types of "PYRENE" Tenders built for oil companies. It is equipped with a tank carrying 600 Imperial gallons of foam compound, one No. 20 and two No. 10 "PYRENE" Mechanical Foam Generators and four No. 10 Foam Branchpipes. It is capable of delivering 3,600 Imperial gallons of foam per minute for approximately 30 minutes — a total of 108,000 Imperial gallons. The pump is driven by power take-off. Extra equipment—2. P.D. 20 "PYRENE" CO_2 Dry Chemical Fire Extinguishers. The chassis is a Dennis "F2" with a Rolls Royce B.80 160 B.H.P. Engine.





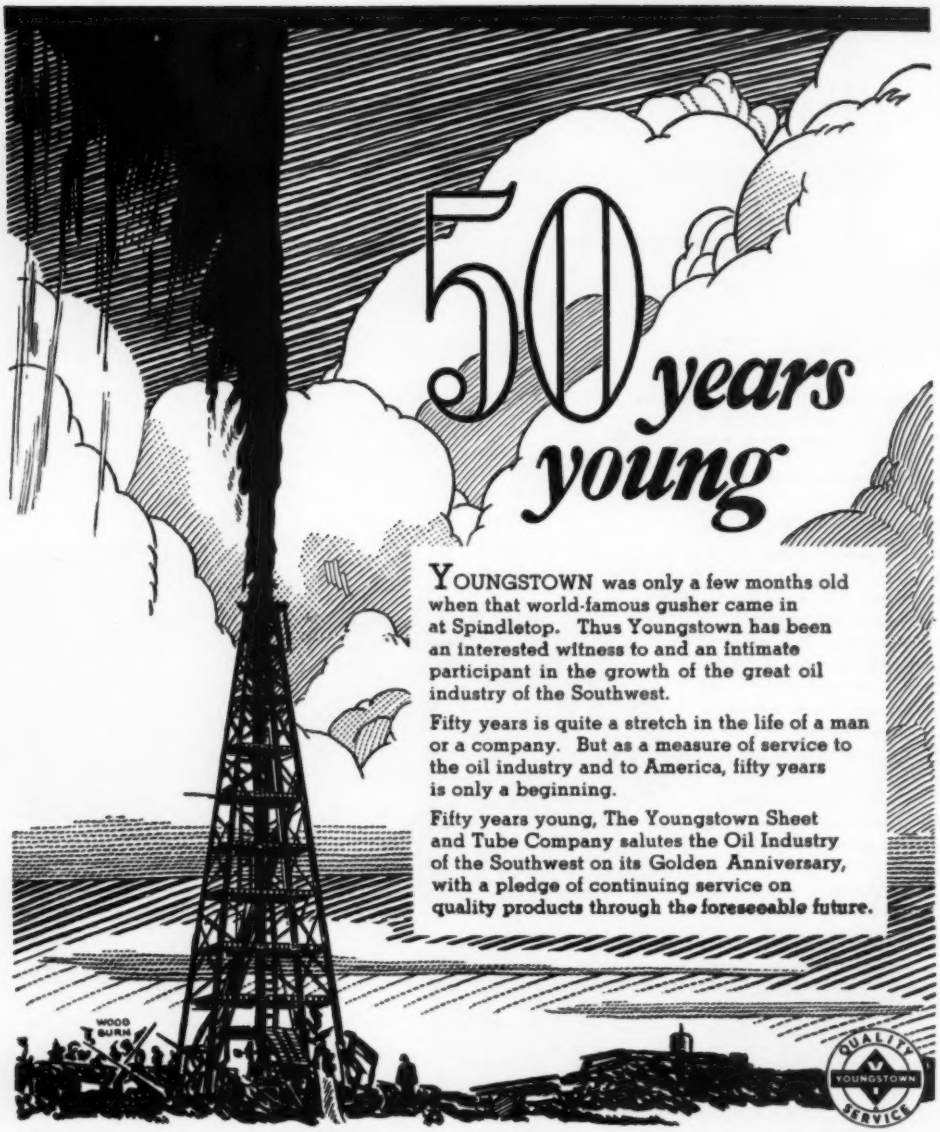
The "PYRENE" range of equipment includes types of fire extinguishers and appliances to meet every known fire risk, fire affecting workshops, stores, office buildings, electrical plant and so on.

P.D.20 CO_2 DRY CHEMICAL FIRE EXTINGUISHER

This new extinguisher, the "fastest ever," is remarkably effective in dealing with the smaller outbreaks involving oils, spirits, alcohols and solvents. It smothers these dangerous fires in a matter of 2 or 3 seconds. The dry chemical discharged on the fire is non-toxic, non-conductive, non-corrosive and non-freezing.

Pyrene TRADE MARK

THE BEST KNOWN NAME IN FIRE PROTECTION


50 years young
YOUNGSTOWN was only a few months old when that world-famous gusher came in at Spindletop. Thus Youngstown has been an interested witness to and an intimate participant in the growth of the great oil industry of the Southwest.
Fifty years is quite a stretch in the life of a man or a company. But as a measure of service to the oil industry and to America, fifty years is only a beginning.
Fifty years young, The Youngstown Sheet and Tube Company salutes the Oil Industry of the Southwest on its Golden Anniversary, with a pledge of continuing service on quality products through the foreseeable future.
WOOD BURN
QUALITY
YOUNGSTOWN
SERVICE

Scrap Metal is Critical Again

The Youngstown Sheet and Tube Company

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MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

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designed by Richard Arbib for
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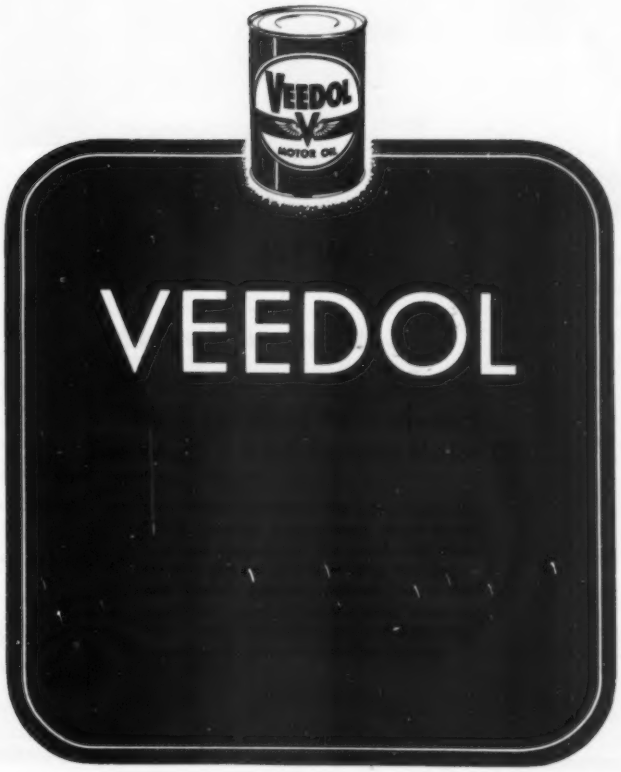
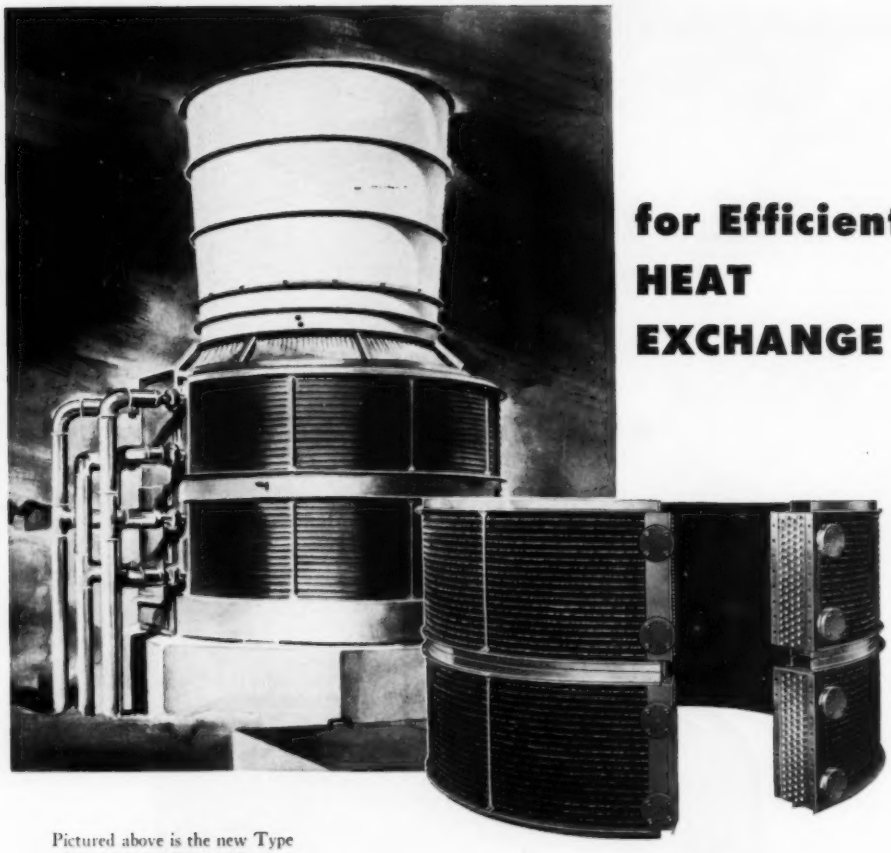


TIDE WATER
ASSOCIATED
OIL COMPANY



for Efficient HEAT EXCHANGE

Pictured above is the new Type "E" QUINTAIR *Air Cooled Heat Exchanger,* designed, engineered and manufactured by J. F. Pritchard & Co.'s Equipment Division. Curved Aerofin sections *(see illustration at right)* enable this unit to take maximum advantage of winds from any direction. Especially suited for engine and compressor jacket water cooling.

• • • Always Specify AEROFIN

Regardless of the heat-exchange application — or the operating conditions which prevail . . . regardless of the type of atmosphere or liquid, Aerofin will supply the design and materials best suited to the job.

Aerofin's unequalled experience, research and manufacturing facilities in the heat-exchange field are your assurance of greatest efficiency and longest service life.

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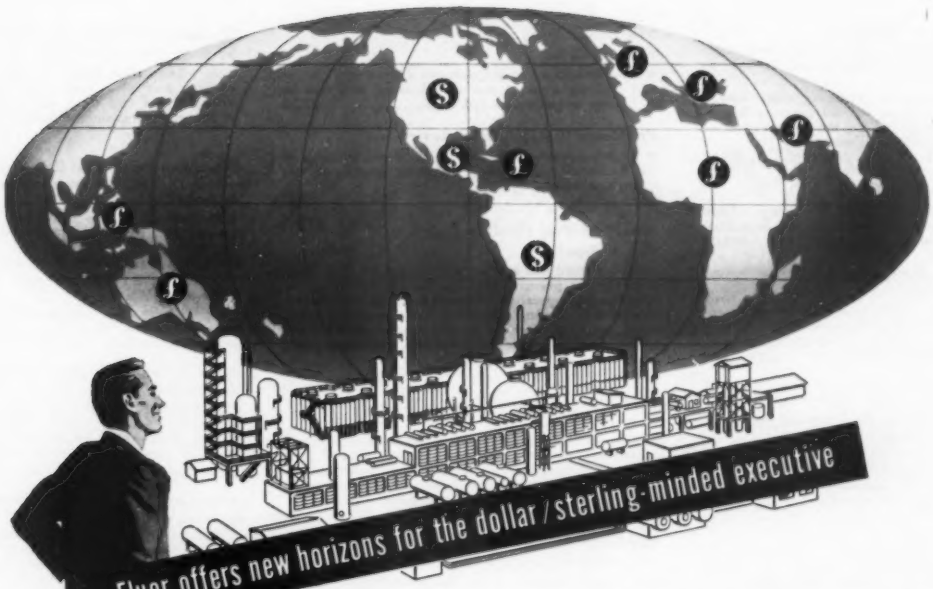
Aerofin is sold only by manufacturers of nationally advertised fan system apparatus. List on request.



TO FACILITATE the building of petroleum, chemical and auxiliary plants in the sterling and other areas, The Fluor Corporation, Ltd., takes this opportunity to remind you of its association with Head Wrightson Processes Ltd., a British Engineering Organization, currently engaged in the engineering, supply and erection of units for Light Oil and Crude Oil Fractionation, Gas Separation, Solvent Extraction, Chemical Treating, Utilities Supply, Carbon Black Production, etc., within the British Commonwealth and other countries.

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. . . The manufacture and availability in the sterling area of Fluor-designed products including Cooling Towers, both atmospheric and mechanical draft; Fin-Fan Air-Cooled Heat Exchangers; Air-Cooled Mufflers; Pulsation Dampeners and Gas Cleaners.

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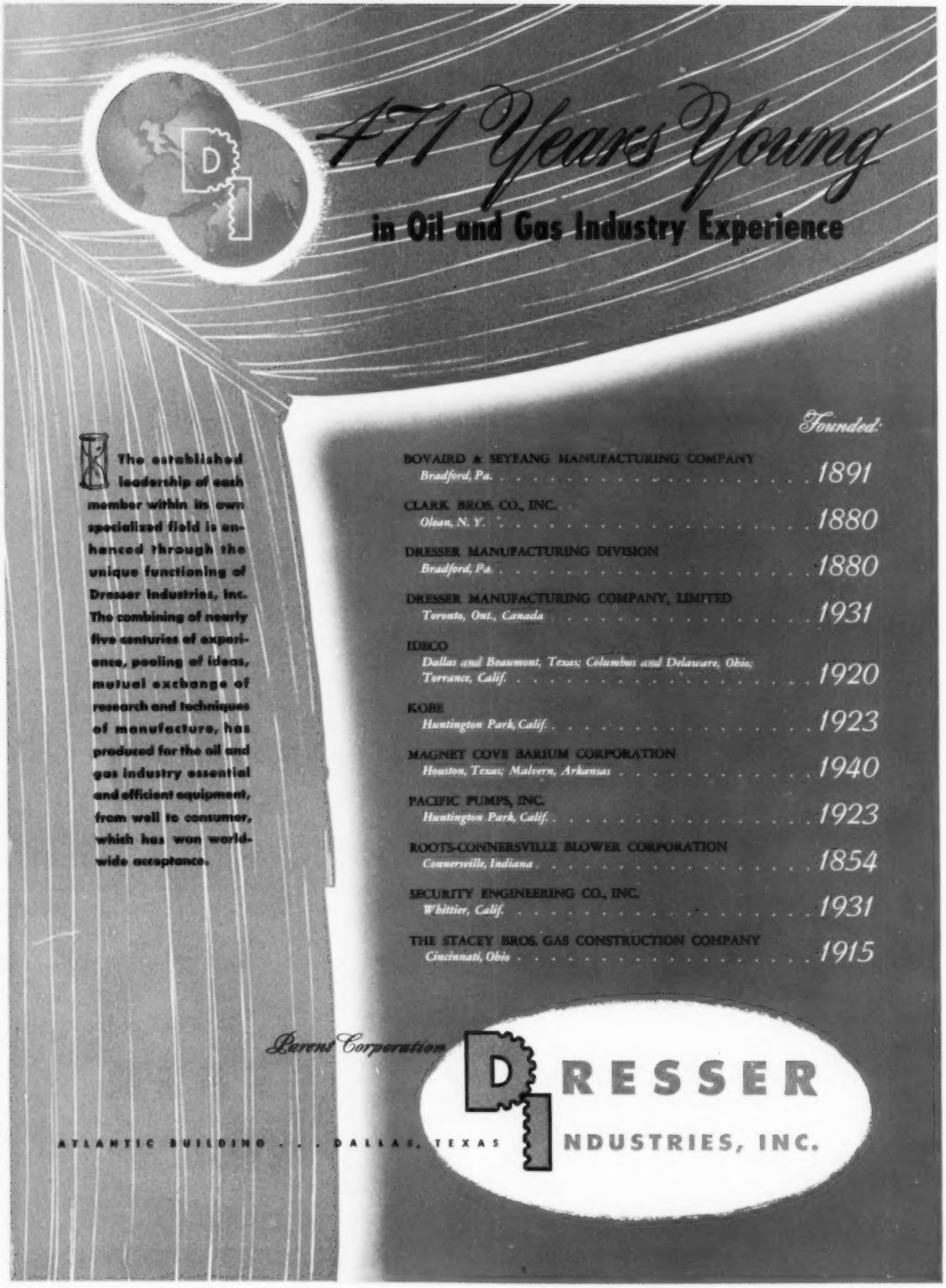
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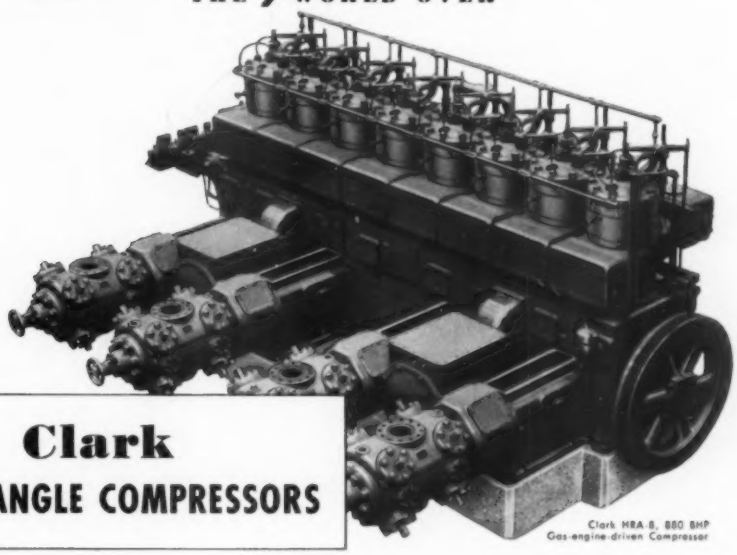

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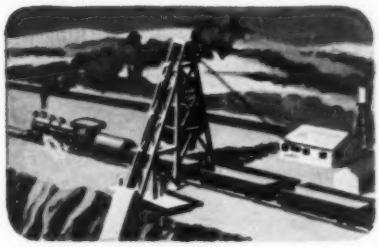

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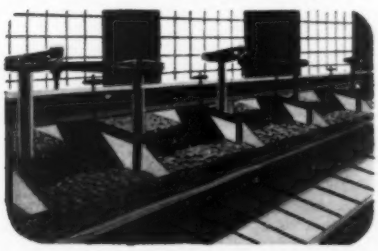

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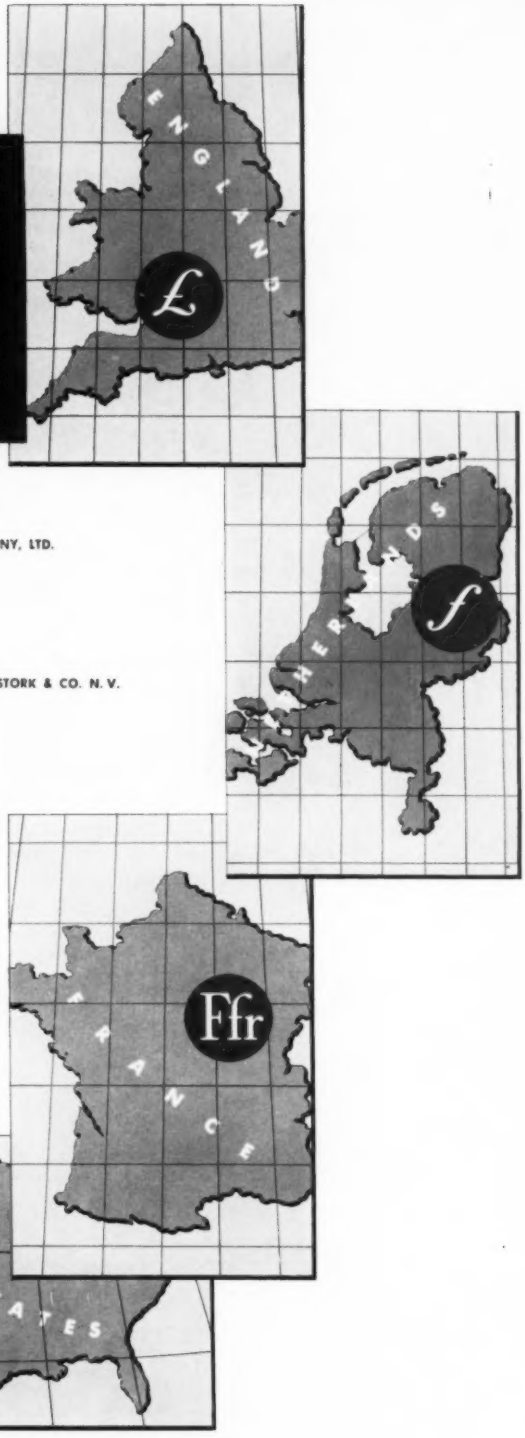

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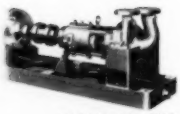
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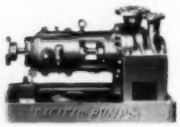
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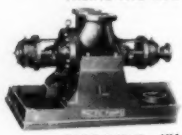
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PETROLEUM CHEMICALS DIVISION

DU PONT NEWS

May ★ One of a Series of Interest to the Petroleum Industry ★ 1951

Petroleum Laboratory Finds Copper Present in Commercial Gasoline Samples

Du Pont's Petroleum Laboratory at Deepwater, N. J. recently checked thirty-three samples of commercial gasoline for copper content and found the element present in seventeen of the samples. The table below shows the geographical distribution of these samples together with a range of copper content observed:

	No. of Samples	*No. with Copper*	*Range of Copper Content in p.p.m.*
Phila.	7	2	.06 to .12
Tulsa	5	2	.06 to .12
Chicago	8	3	.05 to .21
Los Angeles	6	4	.05 to .13
Houston	7	6	.02 to .09

The analyses were conducted by the colorimetric method which will detect copper whether it is deactivated or not. As a result, the data do not indicate how many of the contaminated samples contained deactivator.

Automotive Technologist Specializes in Analysis of Engine Operational Problems

IVER T. ROSENLUND, who came with Du Pont in 1947, is the company's automotive engine specialist for the analysis of operational problems encountered in automotive equipment including farm tractors and heavy-duty trucking units. He was formerly Manager of the Du Pont Road Test Laboratory which operates a fleet of test trucks out of El Monte, California. Mr. Rosenlund is available to automotive equipment manufacturers, fleet operators and others who wish to make use of his extensive experience.

Mr. Rosenlund graduated from the University of Michigan in 1937, with a Bachelor of Science degree in aeronautical engineering, majoring in engine design. He spent the first few years of his career in aircraft engine testing and the development of automatic machine tools for the manufacture of aircraft engine parts. He has been actively engaged in problems of combustion and lubrication of engines since 1939 when he became a research engineer on engine testing for the development of petroleum products for the Texas Company in its research laboratory at Beacon, New York.

Between 1942 and 1947, Mr. Rosenlund was fuel and lubrication engineer for Allison Division of General Motors and later joined the Packard Motor Car Company in the jet-engine division at Toledo, Ohio, as project engineer on combustion chamber design and development.

Du Pont Truck Fleet Develops Valuable Heavy-Duty Road Test Data

What would you think of a fleet owner who gave his drivers instructions to take a load of gravel on a 208 mile jaunt and to return without delivering the cargo? Yet this is what happens regularly to each of six identical semi-trailer combinations operating out of the Du Pont road test laboratory at El Monte, California.

Shown are two of the fleet of six trucks used by Du Pont to make commercial, heavy-duty road octane tests. Each truck grosses 26,000 pounds on every trip. The terrain at this point appears rugged.

In evaluating the performance of experimental antiknock fluids prior to release for consumer use, laboratory testing is not enough. That is why Du Pont operates a six vehicle, heavy-duty, commercial test fleet under severe overload conditions on the hill and desert highways around Los Angeles.

A typical test might cover as much as 35,000 miles. As would be expected, much information is developed. Included would be information on octane requirements; valve life; cylinder bore wear and piston ring wear; fuel and oil consumption; and data on sludge and varnish deposits.

Here are some of the interesting characteristics of the fleet which travels without destination, delivers no load, yet brings back highly significant information.

The six tractor-trailer combinations are identical in every way, including their 235 cubic inch valve-in-head engines. The body of each trailer is partitioned to prevent shifting of the gravel which is used to weight the vehicles. This precaution is necessary to maintain a constant load on the tires which often are experimental tires being service-tested by the Rubber Chemicals Division of Du Pont.

The six vehicles always travel in convoy. They gross 26,000 pounds each. This weight corresponds to a sixty per cent overload for the tractor rating. With this loading, full throttle operation is required over most of the

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OVER

DU PONT

PETROLEUM CHEMICALS DIVISION
NEWS

DU PONT

Refinery Calls in Du Pont Automotive Specialist to Solve Annoying Problem

Fleet Customer Blamed Trouble on Refiner's Fuel

An Eastern District customer of Du Pont had complaints of engine sludging and heavy deposits on intake ports and valves from a fairly large fleet using its products. As is often the case, the refiner's products were blamed.

The refiner asked one of Du Pont's automotive specialists to investigate. He contacted the fleet owner, accompanied by refinery representatives. Several days were consumed in discussing the problems and in examining the fleet units and their operational patterns.

Both passenger cars and trucks were involved. Daily mileages were low, ranging from 40 to 100 miles. There was little prolonged heavy-duty work. Much of the operation was under conditions where engines were never completely warmed up in the course of a day.

Lengthy round-table discussions ended in the conclusion that most of the vehicles were subjected to unfavorable operating conditions such as prolonged idling and low output operation, with short hauls, frequent shutdown, and subnormal operating temperatures. These operating conditions, plus too infrequent oil change periods, were considered to be sufficient to cause the crank case sludging and intake valve troubles reported. Remedial recommendations were made and carried out to a satisfactory solution of the problem.

From the above it will be seen that Du Pont can contribute both knowledge and experience to the solution of a problem in the field. In such matters Du Pont will cooperate wherever it is feasible to do so.

Du Pont Offers *New Blending Calculator*

(AVIATION MIX)

A slide calculator for easy determination of the number of pounds of Du Pont Tetraethyl Lead Compound – Aviation Mix required for a given quantity of gasoline, is available through Du Pont Petroleum Chemicals Division District Offices.

The calculator is designed as a time-saver for blenders, chemists or others engaged in blending tetraethyl lead compound with gasoline.

Convenient in size, 9" x 4½", the calculator easily fits into a desk drawer or a coat pocket. With it, one can calculate the pounds of TEL Compound required to treat a given number of barrels of gasoline to produce concentrations from 0.1 to 4.6 cc. of TEL per gallon.

The calculator is quickly set in one operation.

This extremely handy Du Pont TEL Compound (Aviation Mix) Blending Calculator can be supplied by the nearest Du Pont Petroleum Chemicals Division District Office.

LITERATURE AVAILABLE

The following is a partial listing of free Du Pont bulletins, reports, booklets and aids available to you. Address requests to your nearest Du Pont Petroleum Chemicals Division District Office.

Du Pont Services to the Petroleum Industry ..... Serial A-663

Exhaust Valve Rotation – covers the use of mechanical devices to improve valve life ..... Serial A-656a Pet.

Du Pont Gasoline Antioxidants Nos. 5, 6 and 22 – describing their use and application for improving gasoline storage stability ..... Serial A-513

The Effect of Hydrocarbon Structure on the Road Antiknock Performance of Motor Fuels ..... Serial A-505

Tank Talk – a 52-page pocket-sized booklet written for the men who actually enter and clean gasoline storage tanks ..... Serial A-1134

CONTINUED

Truck Fleet

test route. The trucks are operated for sixteen hours per day.

The drivers and positions of the trucks are rotated daily to overcome variations which might be caused by differences in driver techniques. Drivers try to treat all trucks alike even in such minor details as braking, shifting and accelerating.

The route presents a normal intercity truck route winding through the foothills and mountains near Los Angeles. There are steady upgrades at full throttle, rolling downgrades requiring closed throttle positions and considerable stop-and-go driving in cities. The 208 mile course requires an eight hour shift per circuit.

Engines are operated at three-quarter to full throttle approximately seventy percent of the time. Average speed is thirty-seven miles per hour – maximum is fifty-five.

Since findings from the operation of this fleet are too detailed to be presented here, the principal purpose of this résumé is to suggest that there is considerable value in fleet work of the type outlined as a reproducible method for investigating differences resulting from fuel variables.

It is believed that experimental compounds which show promise in convoy operated tests can be released for further proof testing in commercial operations with considerable assurance of satisfactory performance. The tests also show that uniformly good performance can be obtained by paying close attention to maintenance techniques.

For more complete data on the findings address your nearest Du Pont Petroleum Chemicals District Office.

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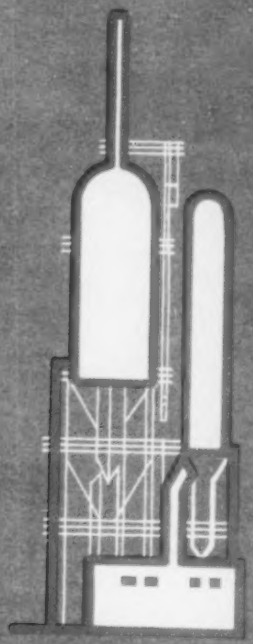

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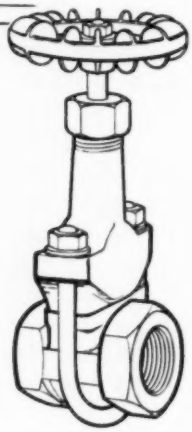

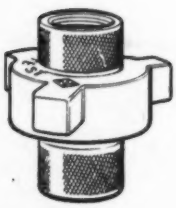

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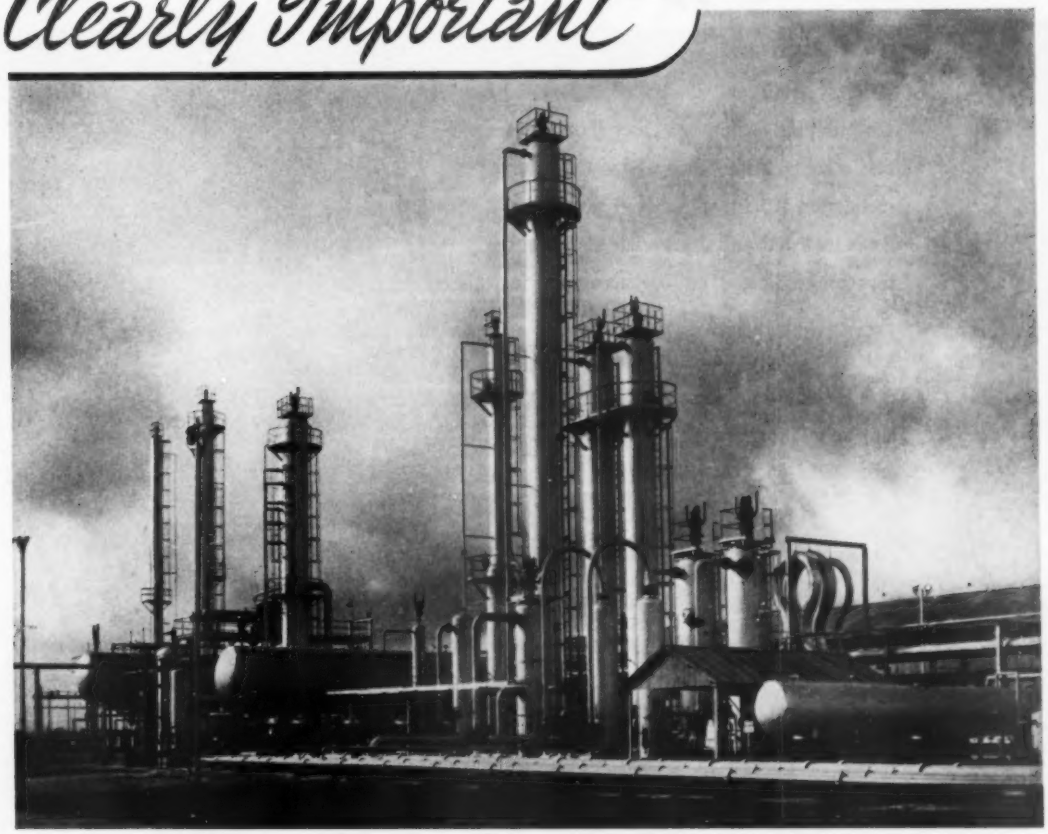

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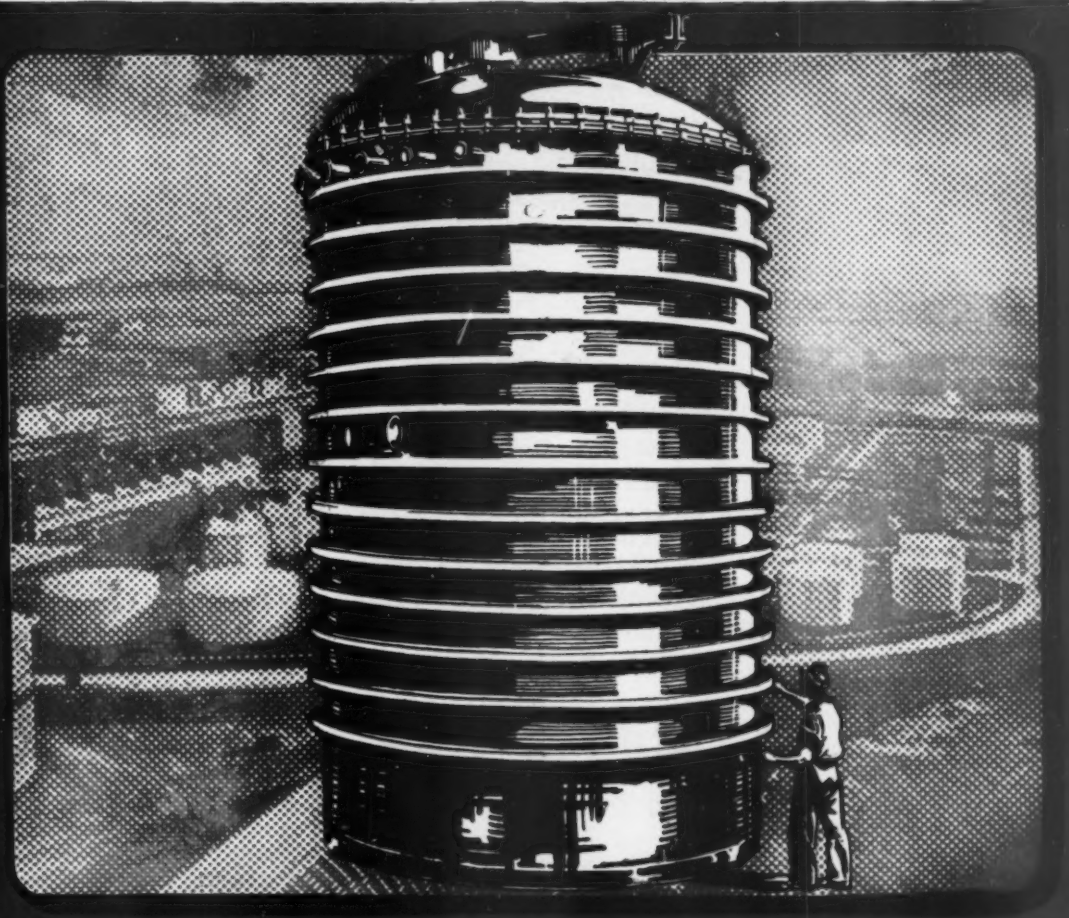

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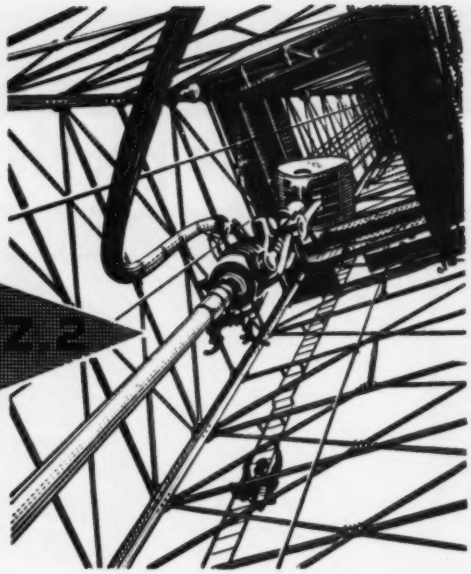

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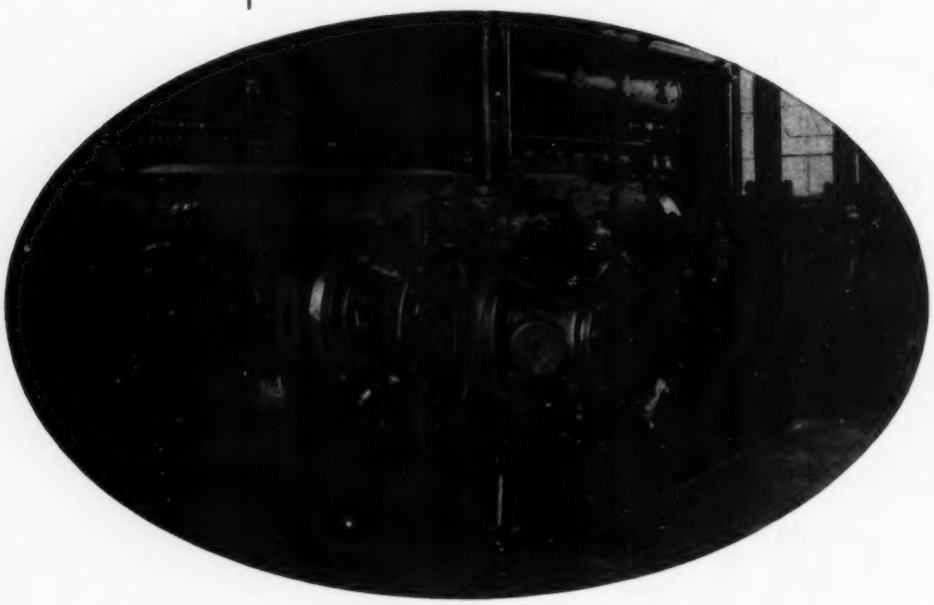

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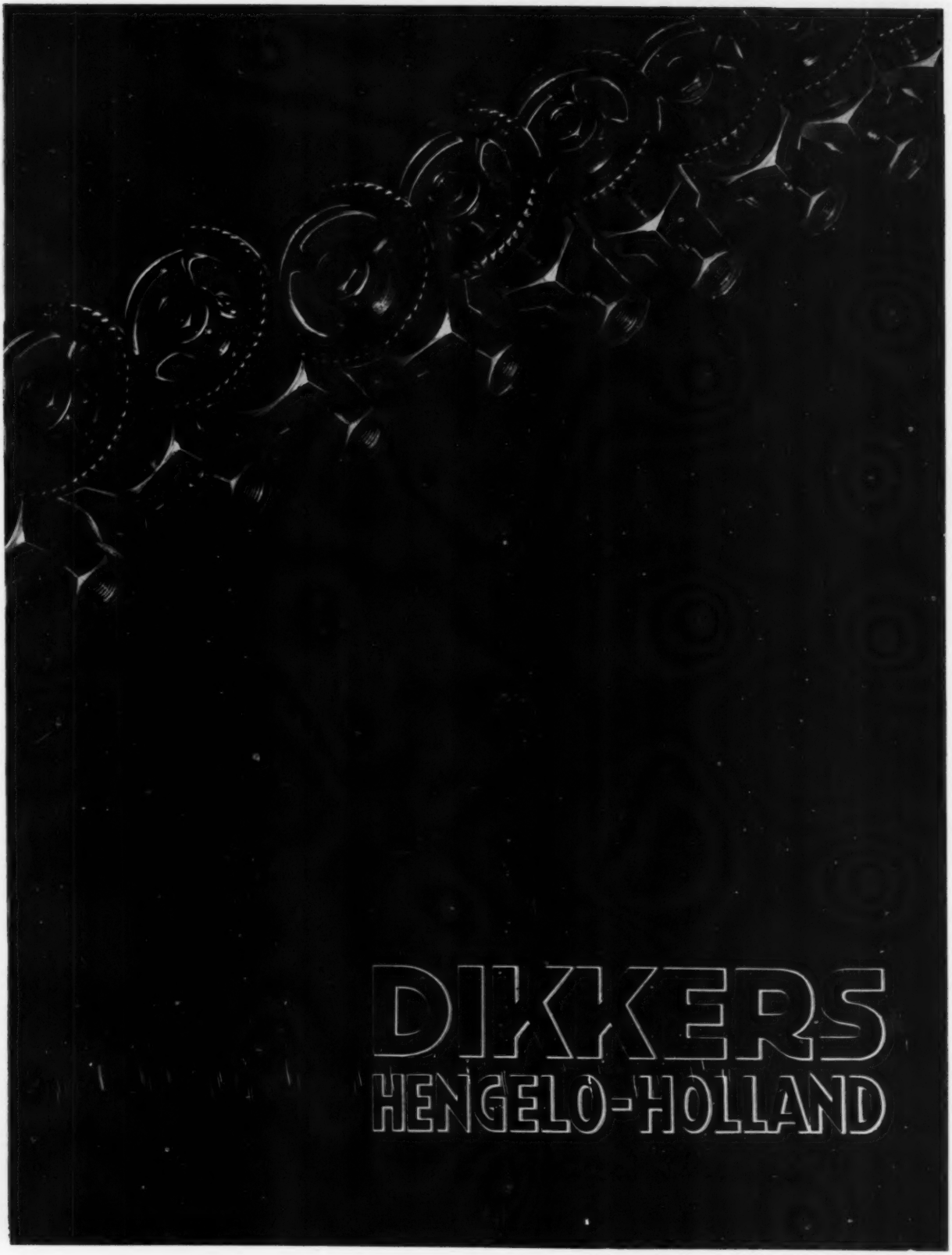
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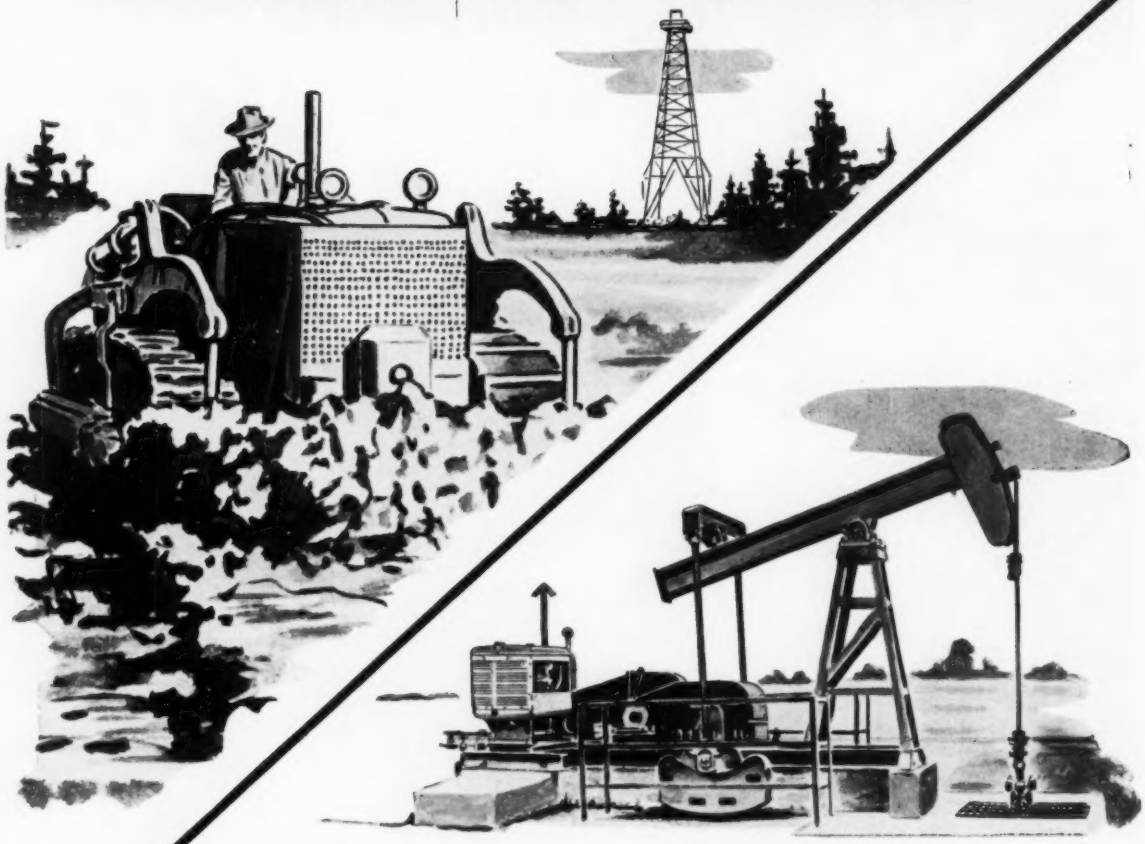

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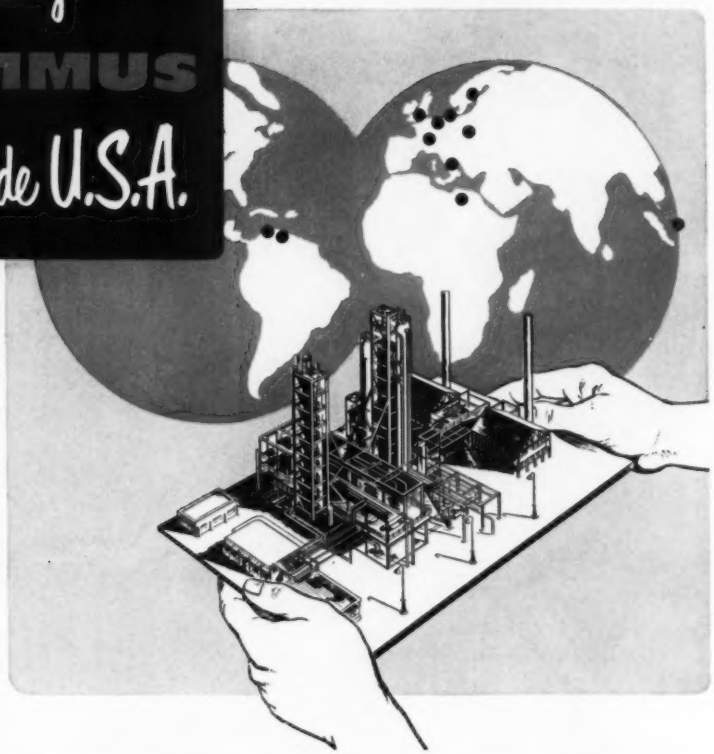

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WORLD PETROLEUM

The Management Publication of the International Petroleum Industry

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THIS MONTH'S COVER

Danish American Prospecting Co., a subsidiary of Gulf Oil Corp., is prospecting for oil, salt and helium in Denmark under a recent concession granted by the State. If oil is found a Danish company will be formed in which the government will own stock and be represented on the directorate. The well behind the ancient Danish windmill is Gulf's Gassum No. 1 located at Hividsten, 12 kilometers north of Randers in northeast Jutland. Drilling is temporarily suspended at 11,359 feet in the lowermost Triassic. Photograph originally was published in Billed-Bladet, a Danish picture magazine, and is reproduced on this month's cover through the courtesy of The Orange Disc, the magazine of the Gulf Companies.

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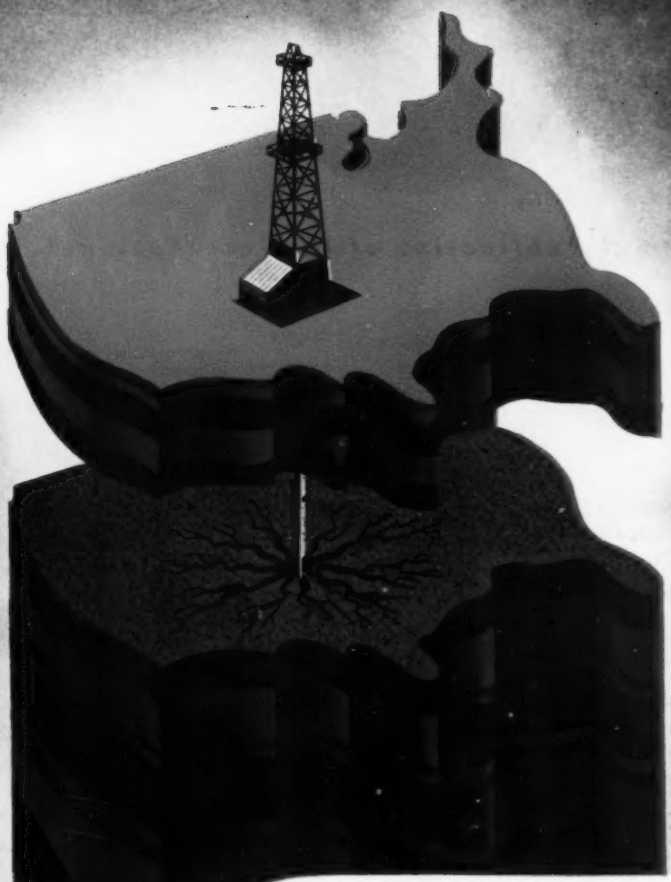

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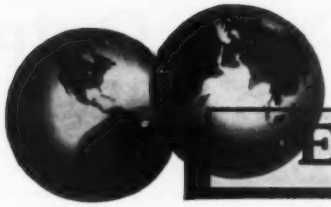


Editorial

Oil Is An International Industry

ALMOST from its emergence as a commercial product petroleum has occupied an important place in international trade. Nearly three quarters of a century ago oil from the hills of Pennsylvania, and later from other discoveries further west, was supplying the lamps of China. Before the dawn of the present era the output of Romanian and Russian wells found eager markets in western Europe. The spread in demand for petroleum products to all corners of the globe was an inevitable result of their adaptability to universal needs. The multiplication of these products, paced by a constant growth in their contribution to industrial progress, has been responsible for the tremendous expansion of the petroleum industry to its present place among the most indispensable and far-reaching activities of the modern world.

Today, more than ever before, the international character of the oil industry and the interdependence of its various parts are strikingly in evidence. The production of crude petroleum no longer is confined to a few countries but is spread across both hemispheres and among many nations. Tanker routes criss-cross the seas and the products they carry compete in markets thousands of miles removed from their places of origin. Thus, it comes about that whatever happens in one part of the oil world has its effect in some measure on every other part.

In earlier times, before the industry had attained its present dimensions, the opening of a single large field might threaten the stability of markets far removed. A striking example of this occurred in the early thirties. Following rather closely upon the opening of a number of fields of flush production in the Midcontinent of the United States came the entry of East Texas, greatest of all. Coming in a period of widespread industrial depression when demand was abnormally reduced it forced down prices to the lowest level they had touched in many years and had a drastic effect not only in America but overseas as well. In recent years, however, the growth in demand for petroleum products has been so rapid in every part of the world that the chief problem before the industry has been one of finding the oil to meet these rising requirements. Even the development of new fields in the Middle East with reserves of vast proportions has not shaken the strong position of the industry and the growing output of their wells has been readily absorbed by broadening demand.

It is noteworthy that most of the initial discoveries of important oil fields, and with few exceptions their later development, have been due to individuals or to companies organized with private capital. By its very nature the search for oil with its element of heavy risk and the high ratio of failures to successes appeals more strongly to private initiative than to government officials. Likewise the development of fields once discovered involves the command of techniques which those in official positions seldom possess and the taking of risks which they are not anxious to assume. In some instances, governments have taken over established industries and even have attempted exploration to locate undeveloped resources, but their efforts to manage such operations have not been conspicuously successful. In general, they have found it more profitable to take the assured revenue that can be derived from oil for use in other fields of development and to exercise their authority in regulating the conditions under which the industry shall be conducted.

Thus it is that the oil industry, speaking generally, occupies the favorable position of offering to its members full opportunity for the unrestricted exercise of their ability and ingenuity. It welcomes new ideas and improved processes, encourages research and does not hesitate to scrap obsolescent equipment in favor of that which will give better results. While it is highly competitive in its sales activities it recognizes the value to the industry as a whole that comes from the prompt adoption of innovations that result in better service to the users of its products. Therefore, it encourages the exchange of information on the results of research and experimentation.

An instructive manifestation of the oneness of the oil industry in matters fundamental to its progress is the Third World Petroleum Congress which assembles at The Hague on the 28th of this month of May. The meeting, arranged under the supervision of a Permanent Council made up of outstanding leaders of the technological branches of petroleum activity, assisted by national committees in each of the countries having a well established oil industry, will bring together prominent members of scientific bodies, research organizations, government agencies, oil companies and the consulting profession from some forty different countries and dependencies.

At the many special sessions of its ten divisions during the ten day period over which the convention will extend 250 or more papers will be presented and discussed. These papers will cover all of the industry's varied technical activities, will describe significant discoveries and advances, will present the results of recent investigations and experimental studies and will propound theories that are under test. In sum it will provide a review of activities on which the oil industry is spending hundreds of millions of dollars every year.

The practical value of this exchange of information and the broadening influence of the discussions and contacts that the Congress will afford cannot be exaggerated. The existence of the Congress and the freedom and scope of its programs is a tribute not only to its organizers and to the men who give freely of their time and energies to its successive meetings but also to the world oil industry which so loyally and in such broad minded fashion upholds its work.

First Quarter World Crude Output 9.3 Percent Higher Than 1950

WORLD production of crude oil in the first quarter of 1950 is estimated at 11,391,100 barrels daily. This is an increase of nearly a million barrels as compared with the average of 10,421,900 barrels daily in 1950 and is nearly two million barrels over the 1949 average.

The increase in output during the early months of 1951 for principal areas has been roughly proportional to the total although both the United States and Venezuela were producing a larger percentage of the global total than last year and the Middle East slipped a bit.

Percentage distribution by main areas of the world in the first quarter of 1951 compared with 1950 are as follows:

Percent of World Output

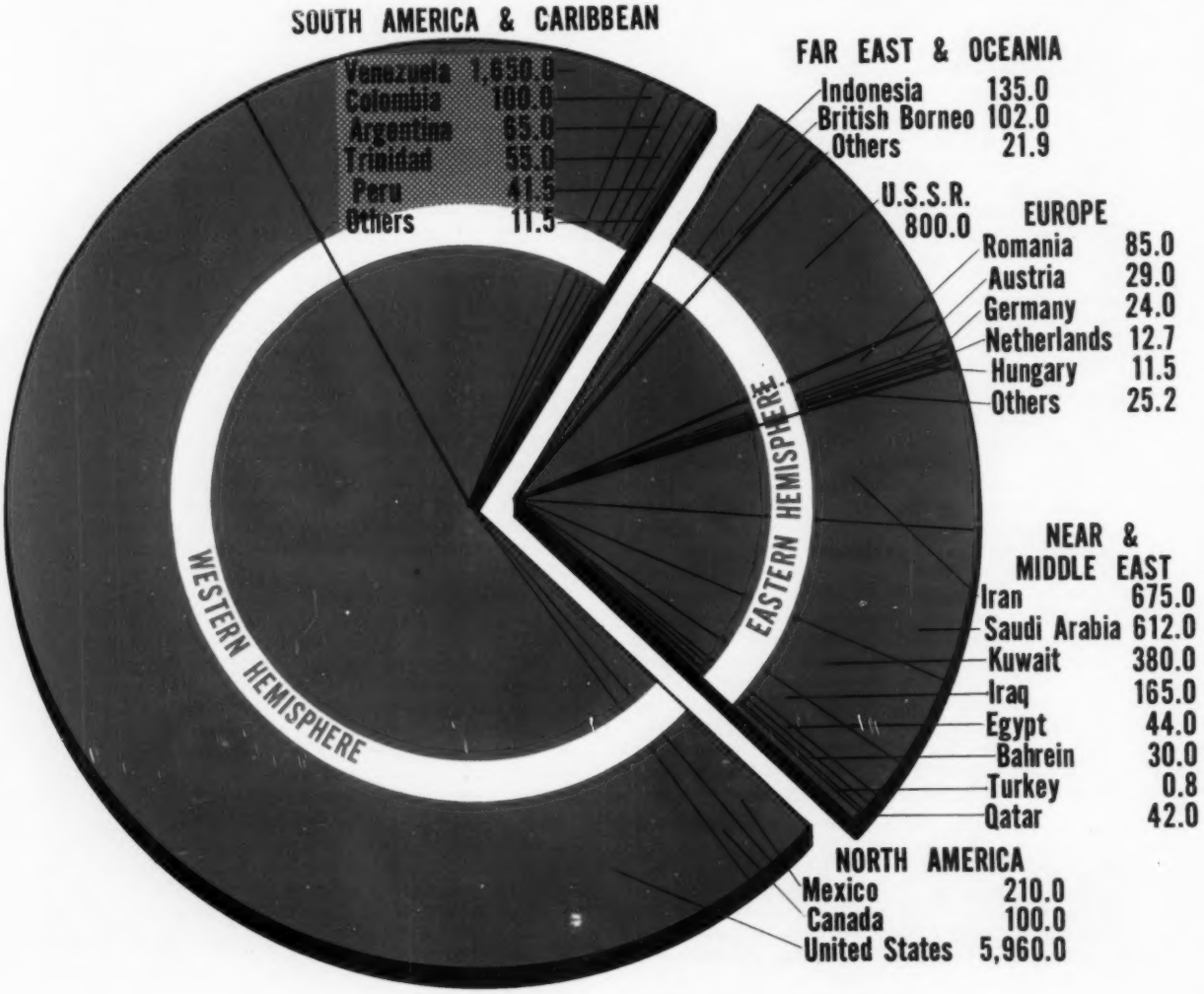
	First Quarter	
	1951	1950
United States	52.3	52.0
Venezuela	14.5	14.4
Western Hemisphere	72.0	71.5
Middle East	17.1	17.3
USSR	7.0	7.3
Eastern Hemisphere	28.0	28.5

Successful completion of the fourth five-year plan in the production of crude oil has been announced officially to the United Nations by the Central Statistical Administration, Council of Ministers of the USSR. The petroleum industry as a whole exceeded the plan by one percent in 1950 compared with three percent in 1949 and eight percent in 1948.

Goal for the natural gas industry in 1950 originally was set at 8.4 billion cubic meters (three trillion cubic feet). The statistical office reports that this was exceeded by 21 percent. This would indicate a production in 1950 of 3.63 trillion cubic feet.

Crude production for the year 1950 was planned at 250 million barrels or about 690,000 barrels per day when the new plan was set up in 1945. At that time USSR production was down to 370,000 barrels daily as a result of war difficulties. Before the war, in 1940, Russian production had been about 610,000 barrels daily.

Figures supplied by Russian statisticians are somewhat confusing because they are invariably related to the plan rather than being



expressed in absolutes. In the case of crude production it is stated that 1950 output was 146 percent of 1947. Based on a production in 1947 of 540,000 barrels daily this would suggest a production in 1950 of 790,000 barrels daily. It is agreed by a number of students that Russian production at the end of the year did reach about 790,000 barrels daily but the average output for the year was on the order of 745,000 barrels daily.

Petroleum Press Service of London has made a study of available pronouncements by the USSR and has calculated that 1950 production totaled 37.6 million metric tons or about 273 million barrels. This is almost double the 1945 production and 21 percent higher than prewar.

According to Press Service the USSR figures reveal that production in the old fields of the west and south has not responded well to the work exerted on them. Before the war almost all Soviet oil came from these fields. In 1940 eastern and central fields produced 27 million barrels and the western and southern fields 200 million barrels. By 1945 the older regions had dropped to 90 million barrels and the central and eastern fields were up to nearly 50 million barrels.

The five year plan contemplated raising southern and western regional output to 165 million barrels by 1950 but the actual accomplishment was only 117 million barrels, 39 percent under 1940. In comparison with this failure in the Caucasus and Galicia the showing of so-called "Second Baku" north of Kuibyshev and of the eastern fields has been quite spectacular. Increase over 1940 has been 559 percent to 152 million barrels in 1950. The 5-year plan had set a goal for these fields of 90 million barrels, equal to slightly more than the 1945 production of the older regions. Output of the central region alone is half of the nation's total. Sakhalin continues steady at around 19,000 barrels daily and a similar volume is produced in Turkestan. Production in the far north has been begun.

During the next five years the USSR plans to expand its output at the rate of about six percent per year to reach 1,200,000 barrels daily in 1960.

Official announcements of production in two satellite countries have caused an upward revision in recent estimates. Albania has announced that 1950 output was 7,700 barrels daily compared with 6,000 barrels per day in 1949. Romanian production rose somewhat in the early part of 1950 but it has not been possible to sustain the rate and output again is down to 85,000 barrels daily and tending lower. Austria has stated that 1950 production averaged 28,400 barrels daily compared with 25,000 barrels the previous year.

Despite the recent unrest in Iran the level of crude production in the Middle East has continued to rise in line with the upward trend in demand. Average for the first quarter is estimated at 1,948,000 barrels daily, almost exactly the current production of South America. The present level is 35 percent greater than the average for 1949 and 8.1 percent greater than last year.

With Tapline in operation Saudi Arabia has been increasing its production at a faster rate than other areas on the Persian Gulf. As this is written production of Saudi Arabia is running about 640,000 barrels daily and the average for the first quarter will be on the order of 612,000 barrels daily. The January average was 561,000 barrels and February 634,000 barrels daily. Kuwait is increasing its output in similar proportion. January production averaged 422,000 barrels daily compared with an average of 345,000 barrels in 1945. Since then there has been some cutting back so that average for the first quarter now is estimated at 380,000 barrels daily. Qatar and Bahrein both provide steady quotas of crude, Qatar at about 42,000 barrels daily and Bahrein at 30,000 barrels.

The domestic producing industry in the United States take pride in the fact that it has been able to increase domestic production from 5,042,000 barrels daily in 1949 to its current level of nearly 6,000,000 barrels. The industry still has surplus capacity available to meet emergency demands such as those imposed in the peak winter season. Transportation capacity likewise has been expanded greatly since World War II so that the lack of reserves of oil in steel storage is minimized to some extent. Nevertheless the industry will welcome the slower spring and summer months as providing an opportunity to prepare for next winter, on the theory of average warm winters since 1947-48 make more likely the return of another subnormal winter which might tax the industry severely.

In spite of the 7.1 percent increase in United States crude production in 1950 the industry did not find it possible to rebuild inventories. Total stocks of all oils decreased 16 million barrels and stood at 74 days supply on December 31 compared with 87 days supply at the end of 1949.

This decrease in storage in terms of days supply is viewed in a serious light by many of the industry's economists. Dr. Courtney C. Brown of Standard Oil Co. (N.J.) recently pointed out that United States stocks of all oils have risen only 30 million barrels or 5.5 percent in the past ten years while sales have increased 55 percent. Refinery crude runs are 48 percent greater than ten years ago and crude stocks above ground are 3.5 percent less.

Western Canada oil was not yet on the Great Lakes during the first quarter so the effect of the Interprovincial pipe line was not fully reflected in Alberta crude production figures. Considerable western oil has been going into storage at Superior, Wis., for use when the navigation season opens. Despite Canada's increase of 14 percent in demand last year there was an increase of about four million barrels in inventories in the Dominion.

Mexican production continues to rise and now is about five percent above the 202,000-barrel average recorded in 1950. Last year the increase was nearly 19 percent over 1949 as a result of an ambitious drilling program. Drilling of 886,008 feet was a third greater than in 1949. Pemex completed 219 wells of which 17 were exploratory. Success ratio was 61 percent.

There are no significant changes in crude production in South America except in Venezuela and Colombia. In Venezuela production rose 13.5 percent in 1950 to 1,498,012 barrels per day. At the close of the year the average was well over 1,600,000 barrels daily and it is estimated that the first quarter report will be about 1,650,000 barrels, an increase of about 10 percent over the 1950 average. The Venezuelan record thus is approximately parallel to that of the world as a whole. Colombian production at about 100,000 barrels daily is 7.5 percent above the 1950 average. Tendency has been steadily upward since the middle of 1950.

Percentagewise the production of crude in Brazil and Chile has been sharply higher but these two countries have had only minor success previously in developing crude production. The additions to output from a world supply standpoint are of minor importance.

Although the international petroleum industry increased its average output 9.3 percent over 1950 and 22 percent over 1949 in the first quarter the increase was not adequate to permit meeting the astonishing current demand and at the same time build up more adequate inventories. It will be necessary for the industry to continue its present pace and, in fact, to attain higher levels as the year progresses.

WORLD CRUDE OIL PRODUCTION
(Thousands of Barrels Daily)

Country	Year 1949	Year 1950	First Quarter 1951
North America			
United States	5,042.0	5,402.0	5,960.0
Canada	57.5	78.3	100.0
Mexico	167.0	202.0	210.0
Total North America	**5,266.5**	**5,682.3**	**6,270.0**
South America & Caribbean			
Venezuela	1,321.4	1,498.0	1,650.0
Colombia	81.5	93.1	100.0
Argentina	63.5	64.0	65.0
Trinidad	56.5	55.6	55.0
Peru	40.5	41.2	41.5
Ecuador	7.2	7.4	7.5
Bolivia	1.9	1.7	1.6
Cuba	0.3	0.3	0.3
Brazil	0.3	0.8	0.8
Chile	0.4	1.2	1.3
Total South America	**1,573.5**	**1,763.3**	**1,923.0**
Total W. Hemisphere	**6,840.0**	**7,445.6**	**8,193.0**
Europe			
Romania	85.0	87.5	85.0
Austria	25.0	28.4	29.0
Germany	16.3	21.6	24.0
Netherlands	11.8	13.4	12.7
Hungary	10.3	11.5	11.5
Yugoslavia	6.5	7.6	8.2
Poland	3.3	3.3	3.3
Albania	6.0	7.7	7.8
France	1.1	2.5	3.6
United Kingdom	0.9	0.9	0.9
Czechoslovakia	0.8	0.8	0.8
French Morocco	0.4	0.4	0.4
Italy	0.2	0.2	0.2
Europe Ex. USSR	**167.6**	**185.8**	**187.4**
USSR*	**690.0**	**745.0**	**800.0**
Total Europe	**857.6**	**930.8**	**987.4**
Near and Middle East			
Iran	561.0	665.5	675.0
Saudi Arabia	477.0	546.7	612.0
Kuwait	242.0	345.0	380.0
Iraq	85.0	136.2	165.0
Egypt	43.5	44.5	44.0
Bahrein	30.0	30.0	30.0
Turkey	0.3	0.8	0.8
Qatar	—	33.7	42.0
Total Near & Middle East	**1,438.8**	**1,802.4**	**1,948.8**
Far East and Oceania			
Indonesia	115.9	134.0	135.0
British Borneo	70.5	87.5	102.0
New Guinea	4.8	4.8	4.8
India	5.3	5.5	5.5
Japan	3.7	5.7	5.9
China	2.0	2.0	2.0
Pakistan	2.6	2.7	2.7
Burma	1.0	1.0	1.0
Total Far East & Oceania	**205.8**	**243.2**	**258.9**
Total E. Hemisphere	**2,502.2**	**2,976.4**	**3,195.1**
World Total	**9,342.2**	**10,422.0**	**11,388.1**

*Include Sakhalin

Program of Congress Events

The Ridderzaal (Hall of the Knights) where opening session of the Congress will be held.

THE Third World Petroleum Congress will be held at The Hague (Scheveningen) Holland from May 28 to June 6, 1951. Registration of members attending the Congress will begin at the Palace Hotel, Scheveningen, on Saturday, May 26, and will continue during the two following days. Official opening of the Congress will occur at 3:30 P.M. in the Ridderzaal (Hall of the Knights) in The Hague. Sectional meetings will begin on Tuesday, May 29 and continue daily thereafter with the exception of Friday and Sunday, June 1 and 3.

Plenary sessions will be held on Tuesday, May 29, Wednesday, May 30, Monday, June 4 and Tuesday, June 5, all at 4:30 P. M. These general meetings will be at the Kurhaus. Sectional meetings will be held at the Palace Hotel, Scheveningen, and the program will be so arranged that three or four such meetings, dealing with different topics will be going on simultaneously. Much of the time of these group meetings will be devoted to discussion of the papers submitted which in most cases will not be orally delivered but will be available in printed form.

Social events during the Congress will include a cocktail party for members at 5:30 P. M. on May 28, a reception by the Netherlands government at 7:30 P. M. on May 29, and one by the municipality of The Hague at the same hour on May 30. The official banquet will be held May 31 at 8:00 P. M. in the Kurhaus, and a concert will be given at 8:00 P. M. Saturday, June 2, in the Kurhaus by The Hague Philharmonic Orchestra.

On days not occupied by meetings technical excursions will be conducted to petroleum installations and other industrial enterprises in various parts of the Netherlands. On other days special excursions for the entertainment of ladies accompanying members will be arranged under the direction of the Excursion Section and the Ladies Committee. A general outline of the program follows:

Sat., 26 May	10.00 a.m. Opening of the Bureau in the Palace Hotel (near the Kurhaus). Registration of members. The bureau will also be open on Sunday, 27 May.

Aerial View of the Kurhaus, Scheveningen, where the Congress will meet.

Palace Hotel, Scheveningen, where sectional meetings will be held.

Mon.,	28 May	9.00 a.m. Registration of members. 1 p.m. Lunch in the Kurhaus for the members of the Committees and the official representatives. 3.30 p.m. Official opening of the Congress in the *Ridderzaal* (Hall of the Knights). 5.30 p.m. Cocktail party in the Kurhaus for all members.
Tues.,	29 May	Sectional meetings. 4.30 p.m. Plenary session: General lecture by Prof. G. HUGEL 7.30 p.m. Reception by the Netherlands Government.
Wed.,	30 May	Sectional meetings. 4.30 p.m. Plenary session: General lecture by Dr. C. M. LEES 7.30 p.m. Reception by the Municipality of The Hague.
Thur.,	31 May	Sectional meetings. 8.00 p.m. Official banquet in the Kurhaus (Optional) 8.00 p.m. International Cabaret (Optional)
Fri.,	1 June	Industrial excursions. Tourist excursions.
Sat.,	2 June	Industrial excursions. Tourist excursions. 8.00 p.m. Concert by The Hague Philharmonic Orchestra (Residentie Orkest) in the Kurhaus.
Sun.,	3 June	Tourist excursions.
Mon.,	4 June	Sectional meetings. 4.30 p.m. Plenary session: General lecture by Prof. J. J. BROEZE.
Tues.,	5 June	Sectional meetings. 4.30 p.m. Plenary session: General lecture by DR. E. V. MURPHREE.
Wed.,	6 June	Sectional meetings. 5.00 p.m. Final phenary session in the Kurhaus.

Ten sections have been organized with sessions to be held mornings and afternoons on Tuesday, Wednesday and Thursday, 29-31 May and on Monday, Tuesday and Wednesday, 4-6 June. Each section will have a chief rapporteur, assisted by one or more deputies, who will present summaries of the papers to be considered with particular attention to points which are suitable for discussion. These sections and their subjects are as follows:

SECTION 1: Geology; Geophysics

a) GEOLOGY
1. Geological significance and regional distribution of oilfields.
2. Methods of geological mapping and correlation.

b) GEOPHYSICS
1. Gravimetric methods.
2. Seismic methods.
3. Other methods.

Rapporteur: Dr. H. M. E. SCHÜRMANN, Royal Dutch/Shell, The Hague, President of Geol. Mining Soc.

Deputy rapporteurs: Professor F. A. VENING MEINESZ, Director of Royal Netherlands Meteorological Office. Dr. B. BAARS, Royal Dutch/Shell, The Hague.

SECTION 2: Drilling and Production

1. Drilling methods and equipment (incl. mud and survey of holes).
2. Production methods and equipment (incl. separation and field layout).
3. Oil field development (reservoir engineering and economic problems).
4. Secondary recovery methods, condensate and gas production.

Rapporteur: L. SCHEPERS, Royal Dutch/Shell, The Hague.

Deputy rapporteurs: J. F. BROWNE, Royal Dutch/Shell, The Hague. H. M. HOHMANN, Royal Dutch/Shell, The Hague.

SECTION 3: Physical Operations in Oil Processing

1. Phase equilibria.
2. Distillation.
3. Extraction.
4. Adsorption.
5. Crystallization.
6. Heat and mass transfer:

Rapporteur: Dr. H. TER MEULEN, Royal Dutch/Shell, The Hague.

Deputy rapporteurs: Professor H. KRAMERS, Technical University, Delft. Dr. G. J. MULLER, Royal Dutch/Shell, The Hague.

SECTION 4: Oil Processes involving Chemical Conversions

1. Hydrogenation and hydrocarbon synthesis.
2. Cracking and reforming (catalytic and thermal).
3. Polymerization, alkylation, isomerization.

Rapporteur: Professor H. I. WATERMAN, Technical University, Delft.

Deputy rapporteurs: W. JAMES, Caltex Petroleum Mij, Pernis Refinery, Rotterdam. P. VAN 'T SPIJKER, Royal Dutch/Shell, The Hague. Dr. J. C. VLUGTER, Director for process res. & dev., Royal Dutch/Shell Lab., Amsterdam.

SECTION 5: Production of Chemicals from Petroleum; their Properties and Applications

1. Solvents.
2. Miscellaneous chemical intermediates.
3. High-molecular compounds.
4. Detergents.
5. Biocides.
6. Fertilizers.

Rapporteur: Professor J. W. H. UYTENBOGAART, Royal Dutch/Shell, The Hague.

Deputy rapporteurs: Dr. J. OVERHOFF, Royal Dutch/Shell, The Hague. Dr. A. J. STAVERMAN, Research Director, High-Molecular Institute T.N.O., Delft. Dr. T. SWARBRICK, Royal Dutch/Shell, The Hague. Dr. G. H. VISSER, Director for product res. & dev., Royal Dutch/Shell Lab., Amsterdam.

SECTION 6: Measurement and Control; Analysis and Testing; Composition of Petroleum

a) INDUSTRIAL MEASUREMENT AND CONTROL.
1. Properties of control systems.
2. Measurement devices and control devices.
3. Special applications.

b) STANDARD METHODS FOR ANALYSIS AND TESTING.
1. Chemical methods.
2. Physical methods.
3. Mechanical methods (rigs and engines).

c) STUDY OF COMPOSITION OF PETROLEUM.
1. Synthesis and properties of components.
2. Laboratory methods for separation.
3. Special methods for analysis and identification.

Rapporteur: Professor J. SMITTENBERG, State University, Utrecht.

(Please turn to page 90)

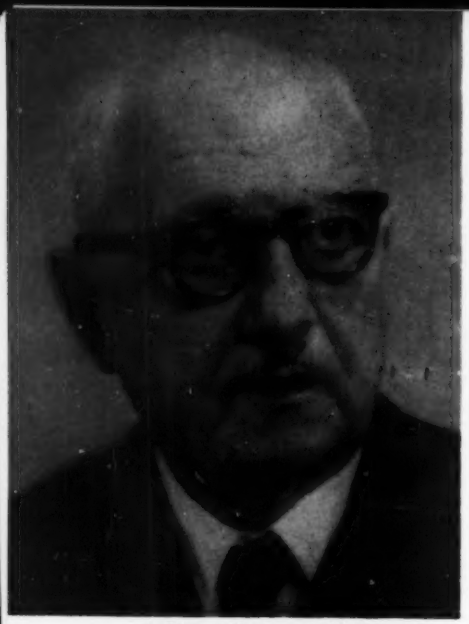
Dr. C. M. Leess

Prof. G. C. Hugel

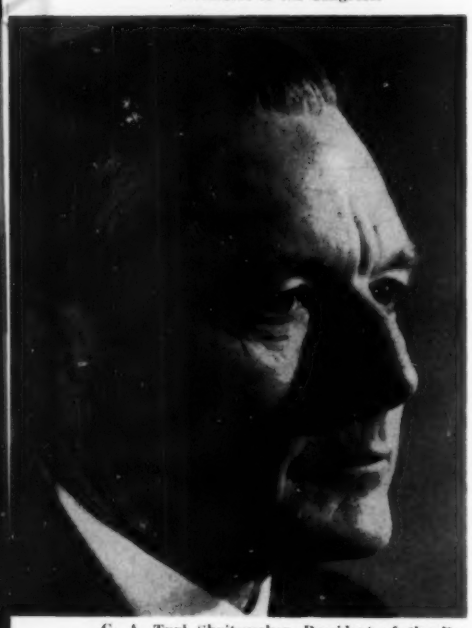
E. V. Murphree

Prof. J. J. Broeze

Third World Petroleum Congress



Jonkheer O. C. A. van Lidth de Jeude, President of the Congress.



G. A. Tuyl Shuitemaker, President of the Permanent Council and Chairman of the Organizing Committee.

THE World Petroleum Congress meets at The Hague, Holland, from May 28 to June 6, 1951 for the third session in its history. The first World Petroleum Congress was held in London in June 1933. It was the outgrowth of discussions among British technical men including prominent members of the Institute of Petroleum and of the interest they were able to arouse among fellow workers in other lands. It was intended to signalize the fact that petroleum, as a commodity and as an industry, had become truly international. It was believed that there were obvious advantages in bringing together members of the industry for the discussion of technical problems and the hearing of papers embodying the results of research or presenting new ideas and improvements in methods and processes. The benefits, it was held, would not be confined to those who attended the meetings but would accrue to the industry as a whole and contribute to its usefulness and efficiency.

The London meeting proved highly successful in all these respects. It attracted men of specialized ability and recognized standing from all branches of the industry and all parts of the world. Under direction of an organizing committee of which James Kewley, then chief chemist of the Shell organization, was chairman, a program of some 150 papers was presented before an attendance of several hundred visiting oil men.

One effect of the first Congress was to convince those who attended it of the desirability of similar conventions at suitable intervals in the future. Proposals looking to this end were discussed, resolutions were adopted and a Permanent Council was established to take charge of the organization of subsequent meetings. The Council is composed primarily of men who are actively identified with technical or scientific work in their own countries. Some of them hold official positions and others are representatives of various institutes or other national organizations. They are appointed by governments or by associations dealing with oil industry affairs in their respective countries.

The second Congress and the first to be organized under the auspices of the Council met in Paris in 1937. In attendance, aided no doubt by the Paris Exposition held in that year, it exceeded the first meeting and its program was broader in scope and in the number of papers presented.

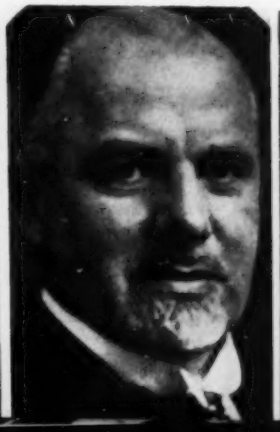
Subsequent to the Paris Congress it was decided that the next meeting should take place in Berlin in 1940. Members of the Council held a session in Dusseldorf in March, 1939, to discuss with German representatives the arrangements for the meeting. Owing to events with which all are familiar that assemblage never took place. In the immediate post-war period it was felt that conditions were not suitable for an international meeting of this sort and it was not until 1949 that the Council felt that the time was near for another successful Congress and accepted the invitation of the leading scientific organizations of the Netherlands to meet at The Hague in 1951. Thus it comes about that a gap of approximately fourteen years separates the second and third congresses. Preparations for the forthcoming meeting have been actively under way since the time when the date was decided upon.

Although the Council was necessarily inactive during much of this intervening period Colonel Louis Pineau of France remained as its president up to the time of his death in September, 1950. His passing was a serious loss to the organization and had in it an element of tragedy. He had been active in the two preceding congresses, had remained

Frank M. Porter, Vice President World Congress and Member Committee of Honor.

Col. S. J. M. Auld, Member of the Permanent Council.

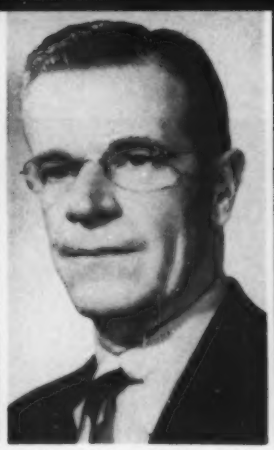
Thomas Dewhurst, Member of the Permanent Council.



Dr. Gustav Egloff, Member of the Permanent Council.

S. Scheer, Member of the Permanent Council.

X. Normand, Member of the Permanent Council.



F. S. Clulow, Member of the Permanent Council and Vice Chairman U. S. National Committee.

D. A. Hough, Gen. Secretary of the Permanent Council.

Hugh C. Tett, Member of the Permanent Council.

Dr. K. G. MacKenzie, Member of the Permanent Council.

as head of the Council during the dark days of the war and had participated enthusiastically in the preliminary planning of the Third Congress. A very able and distinguished successor has been found in the person of G. A. Tuyl Schuitemaker, chairman of the petroleum engineering section of the Royal Netherlands Institution of Engineers and adviser to the Royal Dutch-Shell Group.

Mr. Tuyl Schuitemaker was born in 1889. He studied at Delft Technical University where he graduated in 1913 with the degree of Mechanical Engineer. He remained at the University another year as a post-graduate assistant in physics. During World War I he served as a reserve officer in the Netherlands army. In 1918 he went to Indonesia, traveling by way of the United States and Japan, and entered the employ of Bataafsche Petroleum Maatschappij, one of the companies forming the Royal Dutch-Shell Group. He began his career as a field engineer and subsequently was put in charge of the engineering department in Sumatra.

In 1923 he was transferred to the United States where he spent some time in the purchasing department of Asiatic Petroleum Co., another Royal Dutch-Shell Company, and devoted special attention to the study of gas problems. In 1926 he returned to the Netherlands where he continued as a member of the engineering department at the head office of the Royal Dutch-Shell organization at The Hague until 1950. Since then he has acted in a consulting capacity.

In the course of his professional career Mr. Tuyl Schuitemaker has traveled extensively in the United States, Mexico, Netherlands West Indies, Trinidad, Venezuela, Colombia, Ecuador, Iraq and Indonesia and has acquired a thorough knowledge of the petroleum industry in all those countries.

Other members of the Permanent Council are F. S. Clulow, Dr. K. G. Mackenzie, Dr. E. V. Murphree, and Dr. G. Egloff representing the United States; Col. S. J. M. Auld, Thomas Dewhurst and H. C. Tett for the United Kingdom; J. Filhol, X. Normand and S. Scheer for France; J. A. Beukers and Dr. J. N. J. Perquin for the Netherlands; Prof. P. Erculisse for Belgium; Dr. R. K. Stratford for Canada; Dr. Carlos Perez de la Cova for Venezuela. Representatives of Austria and Italy were still to be appointed when this was written. D. A. Hough of the Institute of Petroleum, London, is general secretary of the Council.

To assure widespread participation in the Congress special committees have been set up in the various countries and have been active in arranging for the presentation of papers and in stimulating interest in the meeting. Chairmen of these committees where such have been designated are as follows: Argentina, Ing. Don Eduardo Senior; Austria, Dr. H. Kupper; Belgium, Prof. P. Erculisse; Brazil, Avelino Inacio de Oliveira; Canada, Dr. R. K. Stratford; Chile, Roberto Muller; Denmark, Percy Ipsen; Netherlands Antilles, Dr. I. R. P. Cohen Henriquez; Finland, Prof. Martti Levon; France, Prof. R. Navarre; Germany, Prof. Dr. Ing. Ernst Terres; Great Britain, C. A. P. Southwell; India, Dr. J. W. Whitaker; Indonesia, Darmawan Mangoenkoesoemo;

J. A. Beukers, Member of the Permanent Council.

Dr. R. K. Stratford, Member of the Permanent Council.

A. A. G. Schieferdecker, Vice Chairman of the Organizing Committee.

W. Alton Jones, Member of the Committee of Honor.

William E. Wrather, Member of the Committee of Honor.

Gen. Ernest O. Thompson, Member of the Committee of Honor.

H. S. Gibson, C.B.E. Member of the British National Committee.

Jonkheer H. G. A. Quarles van Ufford, Member of the Organizing Committee and the Press and Publicity Committee.

Dr. Paul D. Foote, Vice Chairman of the U. S. National Commitee.

J. W. Zwartsenberg, Secretary of the Organizing Committee.

C. A. P. Southwell, M.C., B. Sc., President of the Institute of Petroleum of Great Britain and Chairman of the British National Committee.

Iran, F. Naficy; Italy, Marcello Boldrini; Sweden, B. Groth; Switzerland, Dr. P. Schlapfer; United States, Dr. E. V. Murphree; Uruguay, Alfredo D. Levrero; Venezuela, Dr. Jose Martorano Battisti. Several countries have assigned their representation to local technological societies instead of designating individual committeemen.

Upon the shoulders of the Organizing Committee at The Hague has rested the heaviest task in connection with the Third World Petroleum Congress, that of arranging the general program, setting up a time table and selecting meeting places for the general assemblies and sectional groups, working out a schedule of social affairs and touring entertainment for visitors, and in short handling all the multitudinous details involved in providing for the orderly and instructive presentation of an elaborate program of events.

C. Chilvers, Member of the British National Committee.

Prof. F. H. Garner, Member of the British National Committee.

Chairman of the Organizing Committee is G. A. Tuyl Schuitemaker. Others on the committee are A. A. G. Schieferdecker, vice chairman; J. W. Zwartsenberg, secretary; J. A. Beukers, treasurer; A. Beydals, Prof. J. J. Broeze, E. G. Campioni, Prof. R. J. Forbes, Dr. J. Heslinga, Dr. H. H. Mooy, N. P. Pel, Dr. J. N. J. Perquin, Jonkheer H. G. A. Quarles van Ufford, Dr. J. C. Vlugter, and W. F. Westenenk, members; H. Sangster and C. van de Poll, associate members.

Various phases of Congress activity are in the hands of special committees. In charge of all press and publicity matters are Jonkheer H. G. A. Quarles van Ufford, J. A. Brongers, C. T. A. M. Leo and J. W. Zwartsenberg. Matters relating to the excursions that have been planned are in the hands of Prof. R. F. Forbes, with A. A. Heers as general adviser and Miss M. M. J. U. Jordaan. There is also a ladies committee under the chairmanship of Mrs. B. Th. W. van Hasselt, wife of the managing director of Royal Dutch Petroleum, with Miss Jordaan as secretary. Its task is to arrange for the entertainment of the wives and relatives of members of the Congress during their stay at The Hague.

President of the Congress is Jonkheer O. C. A. van Lidth de Jeude, president of the Royal Netherlands Institution of Engineers. A Committee of Honor has been appointed, consisting of government officials and men prominent in the oil industry. Among its members are Prof. J. R. M. van den Brink, Netherlands Minister of Economic Affairs, Maitre D. U. Stikker, former Minister of Foreign Affairs; Prof. F. J. Th. Rutten, Minister of Education, Arts and Sciences; M. J. M. Louvel, Minister of Industry and Commerce of France; Victor Butler, Under Secretary of British Ministry of Fuel and Power, Maitre L. A. Kesper, Crown Commission for South Holland; Maitre F. M. A. Schokking, Burgomaster of The Hague; Frank M. Porter, President, and W. Alton Janes, Chairman, of the American Institute of Petroleum; Lt. Gen. Ernest O. Thompson and Dr. W. E. Wrather, director of U. S. Geological Survey, representing the Government of the United States; H. Bloemgarten, Managing Director of N. V. De Bataafsche Petroleum Maatschappij; B. Klaare, Managing Director Standard Amerikaansche Petroleum Compagnie N. V.; Jonkheer H. A. van Karnebeek, Managing Director of N. V. Standard-Vacuum Petroleum Maatschappij; J. A. Triska, Managing Director of Caltex Petroleum Maatschappij (Nederland) N. V.

Headquarters of the Congress will be at Scheveningen, the attractive seaside resort close to the city. A registration bureau and information bureau will be maintained in the Palace Hotel, Scheveningen, with interpreters in attendance. Telephone, telegraph and banking facilities will be available.

By special permission of the Netherlands government the plenary opening session of the Congress will be held in the historic Ridderzaal (Hall of the Knights) in The Hague. This ancient hall dating from the 13th century was the castle of Count William II who founded The Hague in 1254. It is one of the palace buildings and it is here that the Queen opens each new session of Parliament on the third Tuesday in September of every year. Other general sessions will be held in the Kurhaus, Scheveningen, and sectional meetings will take place in the Palace Hotel, Scheveningen.

The program of the Congress, including the formal and social affairs to be held in connection with it are outlined on other pages of this magazine. It is the desire of Netherlands officials and of the committees in charge of the Congress and its related activities to make the meeting not only informative but also thoroughly enjoyable to all who attend and no effort will be spared to attain that result.

H. R. H. Prince Bernhard of the Netherlands has agreed to become the Patron of the Congress.

Vice Presidents in addition to Mr. Porter are Prof. P. Erculisse, Belgium; R. Navarre, France; C. A. P. Southwell, Great Britain; Prof. M. Boldrini, Italy; Dr. Gustavo Théry-Fombona, Venezuela.

Preliminary reports indicate that attendance at the Congress will be 2,000 or more.

WASHINGTON

Steel is the Crux Of the Defense Program

By Joseph B. Huttlinger

"THE steel supply situation is in a mess, as naturally it would be at this stage of mobilization. I am not offering any criticism of anybody, but it is obviously in a mess."

So Bruce K. Brown, deputy director of the Petroleum Administration for Defense, frankly describes the situation as it affects the petroleum industry at home and abroad.

Nor does he anticipate an immediately clearing up of the difficulties. Things were bad in the winter, and became worse during the spring. More trouble lies ahead. But by September, the picture should be brighter as procedures for distributing steel to essential industry are perfected and additional supply is squeezed out of non-essential industries.

Reasons for the steel shortages, which have been growing ever since the start of mobilization, are stated by Charles E. Wilson, director of the Office of Defense Mobilization:

(1) The United States began a mobilization program with the outbreak of the Korean war that now sees about 20 percent annually of its steel production going for direct military needs, such as tanks, guns, airplanes.

(2) At the same time, the government directed sharply increased production of freight cars, tank cars, ore boats and other equipment, and embarked upon a steel plant expansion.

(3) At the urging of industry and labor, the government decided to resist raids upon steel for durable consumer goods—automobiles, washing machines, refrigerators and the like. These take 40 percent of the nation's steel output.

At the same time, many essential industries are being called upon for ever greater output to meet the needs of the defense effort. Petroleum is a prime example of this. And to get finished petroleum products, the basic need is steel.

How much steel for the petroleum industry? Industry and government estimates, remarkably close, are in the neighborhood of 11.5 million tons during the current calendar year. This will provide accelerated operations but at levels that are regarded by topside defense planners as a minimum from the viewpoint of national security. This amount of steel would provide for drilling 43,400 new domestic oil wells and 1,800 wells for American companies outside the United States. It would go a long way toward meeting the new goal of a 700,000 barrel daily expansion in domestic refining capacity by the end of 1952 and a million barrels daily by the end of 1953. It would permit large additions to existing oil and gas pipe line systems. This does not mean, however, that steel actually is coming in the amounts and at the current rate needed by the petroleum industry. Take oil country tubular goods, for example, the core of the industry's steel problem. Top government officials have thrown their support behind a "minimum" goal of 157,500 tons monthly production for all of this year. But here are overall, rounded figures on actual mill production:

1950:	Monthly average	150,000 tons
1951:	First quarter	
	Monthly average	130,000 tons
	April	141,600 tons*
	May	142,600 tons*
	June	155,600 tons*

*Estimated

The demand-supply gap appears greater in line pipe production. Topside defense planners have endorsed a two-year steel budget calling for more than one million tons this year for oil pipe line transmission. The budget calls for several times this amount for natural gas transmission lines. But production, according to recent figures has been slipping. Here's the score on line pipe production by quarters:

1950:	First quarter	792,088 tons
	Second quarter	991,486 tons
	Third quarter	936,774 tons
	Fourth quarter	715,957 tons
1951	First quarter	700,000 tons*

*Estimated

Nearly seven-eighths of this output has gone to the oil and gas industry at home and abroad. Here's the breakdown on destinations in the year 1950:

Direct to oil and gas industry	2,276,570
To jobbers for sale to oil and gas industry	356,785
Export (all uses)	336,652
Other domestic uses	466,299
Total	3,436,306

Due to the pipe line situation orders accepted by mills for delivery during 1951 have been moved back from three to 12 months. Mills furnishing small diameter pipe on an allotment basis have reduced the ration by as much as 40 percent within the past six months. PAD has asked NPA to put a floor under production at the present level, but admits this won't correct the situation soon; it will take several months to raise production to the projected level.

Frank Watts, director of the PAD materials division has some answers to the question of what is being done to provide more steel for the oil industry. He has made careful estimates of steel and other material needs. Then, since PAD acts as materials claimant for the oil and gas industry, he has laid these before the National Production Authority and asked NPA to come forth with the steel. That's as far as PAD can go. NPA has endorsed every estimate of the PAD materials division, but since the processes of government are cumbersome, results are slow in appearing.

First noticeable aid from NPA came when it authorized the use of priority ratings by the industry to obtain parts for maintenance, repair and operations. The same March day, it allowed producers to use priorities to obtain oil country goods. But the NPA did not provide measures to make more steel available for oil needs and the priorities did little but lead to a sharing of shortage.

On the hopeful side is the fact that domestic oil producers, drawing no doubt upon inventories, have been drilling at the rate of 48,000 wells annually. PAD hopes that conversion steel, coupled with well-spacing, pressure maintenance, and dual completions, may make steel estimated for 43,400 wells stretch to provide the larger number.

The log-jam in steel cannot be blamed upon the manufacturers. The steel companies have done a remarkable job in rushing the expansion of facilities. Barring strikes or other unavoidable interruptions, they expect to operate above 100 percent of capacity throughout the year. Since steel is the sinew of armament, however, the companies have been bombarded with demands from every side. Every agency of government concerned with the preparedness program is clamoring for more and the satisfaction of all rival claimants is an impossible task.

The steel shortage, in a sense, is but a symbol of other shortages. The government already has taken action to allocate supplies of aluminum, copper, lead, manganese, nickel, tin, platinum, tungsten, zinc, a dozen chemicals, materials and products, as well as steel. Any basic solution, Washington feels, must be sought in the direction of further government controls over production and distribution. And in any further controls the single, compelling solution that suggests itself here is to channel materials from consumer durable goods to essential industries.

Reserves Rise 1.1 Billion Barrels

Proved reserves of crude oil and liquid hydrocarbons in the United States rose 1.1 billion barrels in 1950 according to estimates of the American Petroleum Institute and the American Gas Association. Proved reserves at 29.5 billion barrels at the close of 1950 were at an all-time high.

Proved reserves of natural gas were estimated at 185 trillion cubic feet, an increase of 5.2 trillion during 1950. Production for the year was 6.8 trillion cubic feet and discoveries 12 trillion.

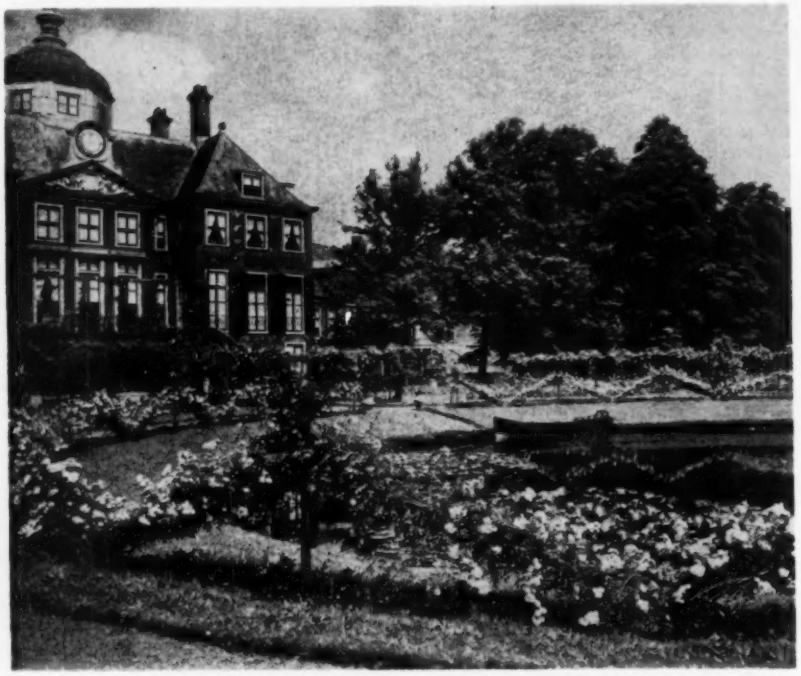
Total proved reserves of crude oil at the beginning of 1950 were 24,649 million barrels. The API committee revised this estimate upwards by 663 million barrels in the light of present knowledge. Extensions of old pools added 1,334 million barrels to reserves and new discoveries 565 million barrels. Withdrawals of crude during the year totaled 1,944 million barrels. Net addition to crude reserves was thus 619 million barrels. Reserves of natural gas liquids increased 539 million barrels during the year to 4,268 million barrels.

Nearly half of the increase in crude reserves was in Louisiana where 396 million barrels of new oil were found and 275 million barrels added to reserves. Wyoming was second with an increase of 149 million barrels in crude reserves. Illinois gained 96 million barrels, Texas 72 million and Oklahoma 67 million. California reserves dropped 89 million barrels to 3,734 million.

Holland Offers Many Attractions

HOLLAND is not a large country but it is a veritable treasure chest of interest and enlightenment for the visitor from abroad. Everything in Holland is different from anywhere else. Even in its typical aspect it is a storybook land. The flat terrain that constitutes the coastal area is relieved from drabness by the lushness of the fields, the many canals, the picturesque windmills that still dot the landscape here and there and in springtime by the miles upon miles of glowing tulips of every hue that spread like a fairy carpet over the land.

But Holland has many other attractions besides its scenic beauties. It teems with historic associations and many visible reminders of the long and critical struggles of the Netherlands people to maintain their freedom and preserve the national life are still to be seen. The museums of The Hague, Amsterdam and Rotterdam contain many world famous works of the old masters, particularly those of the Dutch school, besides other art objects of antiquity and interest. There are still in existence castles that date from the middle ages, walled towns, churches that exemplify the architecture of the 14th and 16th centuries and public buildings of equal age. In many of the older towns and in districts off the main traveled routes the costumes and customs of the distant past are still to be observed.



Rose garden in the Queen's residence "The House in the Wood."

In some of its industries as well as in other respects Holland offers much that is not to be found elsewhere. The flower market at Aalsmeer where daily auctions are regulated by a specially constructed clock and whence shipments are despatched by plane to all parts of the world is the largest in Europe. The cheese factories of Gouda and Edam and the cheese market at Alkmaar where the centuries old guild system still flourishes, the potteries of Delft and many local industries preserve the atmosphere of ages past.

In its modern aspects as well industrial Holland has much to interest the visitor. Its shipbuilding plants, blast furnaces, engineering and electrical works and textile factories are efficient in design and operation and the thoroughness of Dutch methods is such that much is to be learned from observance of their operation.

In planning the program of the World Petroleum Congress its organizers have made provisions for visitors to acquaint themselves both with the past and present of the Netherlands. Two forms of excursions have been arranged for the convenience of members and guests. One series is designed to cover some of the country's principal industrial activities while the other is directed more particularly to points of historic or scenic interest.

A polder in the southern part of Gelderland. Note the dyke with a road on top, separating the lower lands at left from the higher water level at right.

to Visitors

The dates of the technical excursions with the places to be visited follows:

Date	Places to be visited
1 & 2 June	State Mines (coal mines and chemical factories); Margraten (American Cemetery)
1 & 2 June	Wieringermeer; Schoonebeek oilfield (Nederlandse Aardolie Maatschappij)
1 June	Royal Dutch Blast Furnaces and Steel Works, IJmuiden; M.E.K.O.G. (nitrogen factory), Velzen
1 June	Asscher Diamond Works, Amsterdam
1 June	A.K.U. (rayon industry) and Thomassen Engine Works, Arnhem
1 June	Refineries of N.V. De Bataafsche Petroleum Maatschappij (Royal Dutch/Shell Group) and Caltex at Rotterdam-Pernis
1 June	Philips (wireless, television, electrical equipment), Eindhoven
1 June	Royal Dutch/Shell Laboratory, Amsterdam
1 June	Royal Dutch/Shell Laboratory, Delft
2 June	Werkspoor (engineering works), Amsterdam
2 June	Schiphol Airport — K.L.M. (Royal Dutch Airlines), Amsterdam
2 June	Wilton Fijenoord (shipbuilders) and Rotterdam Docks
2 June	Wieringermeer and *Afsluitdijk* (Zuiderzee enclosing dam)
2 June	Distilleries J. J. Melchers Wzn. and P. Melchers Sons, Schiedam, and "Bouwcentrum", Rotterdam

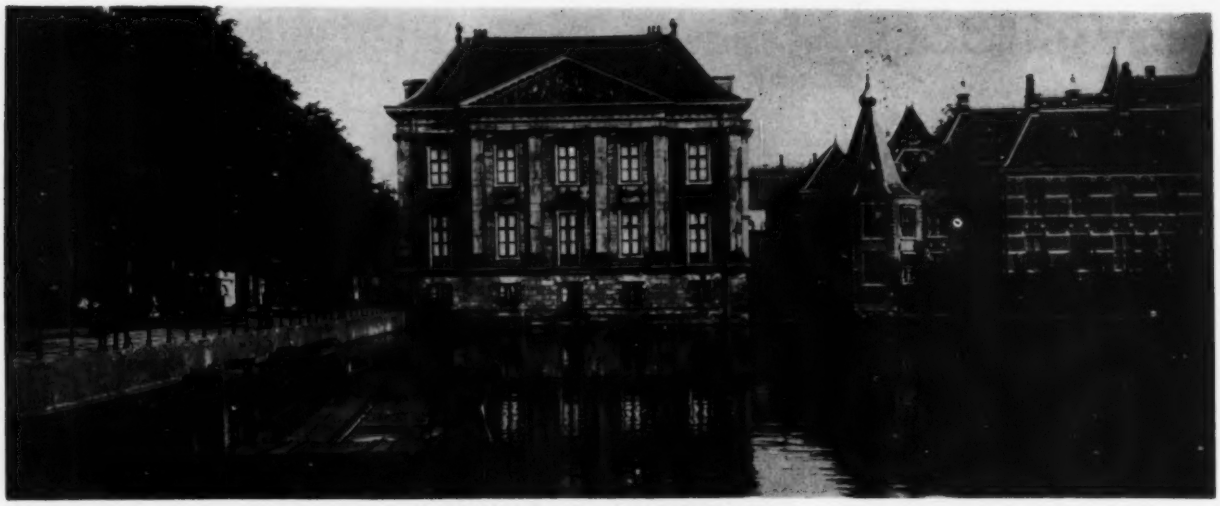
A canal at the Hague, Holland. Many of the city's streets are cut in the middle by these waterways, immaculate of refuse.

In the course of these trips, among which the visitor may make his own selection, it will be possible to see a cross section of Dutch industry including plants that are internationally known in their respective lines. Those whose interest is concentrated on petroleum will have the opportunity to inspect two modern and efficient refineries, that of Bataafsch Petroleum, a member of the Royal Dutch/Shell Group, and that of the Caltex organization which began operation only last year. Both of these are located in the Pernis district of Rotterdam, conveniently near together. The former has been completely rehabilitated since the close of the late war during which it was partially destroyed. It is the largest refinery on the continent of Europe with a throughput of over 82,000 barrels daily and is equipped for catalytic cracking, with a unit now being installed, and for vacuum distillation, thermal cracking and reforming and the processing of gases. Within the past two years plants have been added for the manufacture of oil based chemical products, one a synthetic detergents unit and the other producing plastics of the polyvinal chloride type.

The refinery of Caltex Petroleum Maatschappij (Nederland) N.V., to quote its full title, has a daily throughput of over 20,000 barrels and is a fine example of a compact, thoroughly modern plant embodying the latest developments in efficient and economical opertion. Through the extensive harbor work performed since the war Rotterdam is one

The transport of oil products must continue whatever the weather in the Netherlands may be. A "Shell" inland lighter fights its way through the ice.

Witches' Scales at Oudewater. Visitors may still be weighed by the Town Crier.



Mauritshuis (museum) and Vijverberg, The Hague.

Holland in tulip time. Bulb fields near Leiden.

of the best equipped ports in Europe. Ocean going tankers can anchor alongside the docks of both refineries and there are complete facilities for the distribution of products by the small craft and barges that ply the country's many waterways.

In addition to the two companies maintaining refineries Esso Standard, Sinfina and B.P. market petroleum products in Holland. All products required for land, sea and air transport, for industry, domestic consumption, agriculture and road construction are supplied by these companies.

Kerosine is still extensively applied to household use in the Netherlands and a feature of Esso marketing that is unique and picturesque is still in vogue in the sale of this product. It is called "The Automat." Hundreds of street vendors hawk their wares from push carts piled high with 4-litre tins of kerosine. The yellow "Automat" carts are familiar sights in the streets of Netherlands cities and towns and it is stated that over 50 percent of the household consumption of kerosine is handled in this way.

Dutch housewives have been supplied in this manner for the past fifty years. They like to use kerosine for preparing meals and for heating purposes as well. While changes have taken place in other forms of merchandising the handy 4-litre can has held its own among a million Dutch families, more or less. The spread of gas and electricity has cut into the "Automat" trade to some extent and of late years the use of butane gas has spread rapidly, especially in rural areas. But it probably will be many years before the handcarts finally disappear.

Two spots of special interest to which visits have been arranged are the great research laboratories of the Royal Dutch/Shell on the banks of the Y in Amsterdam harbor and the more specialized establishment at Delft. The Amsterdam laboratories, devoted to study of the production and processing of crude oil, the nature and function of its products and the development of new processes and products, are provided with the most improved scientific instruments, extensive workshops and pilot plants and employ a staff of over 1,500.

At Delft particular attention is paid to the study of fuels and lubricants on the one hand and to engines, burners, gears and bearings on the other.

A spot that should be visited by visiting oil men who can make the trip is Schoonebeek, the one producing oil field in the Netherlands, of which its citizens are extremely proud. It lies in the province of Drente close to the German border where the Nederlandse Aardolie Maatschappij, owned jointly by Royal Dutch/Shell and Standard Oil Co. (N. J.), operates about a hundred wells producing about 14,000 barrels daily or about 25 per cent of Holland's requirements. The park like appearance of the field may provide useful suggestions to oil industry members from other countries.

By contrast with the trips arranged for the benefit of petroleum technologists the so-called tourist excursions are directed to the historical and picturesque features of the Netherlands. The program of such excursions is as follows:

Date	Morning excurions
29-30-31 May 1-2-4-5 June	The Hague (Peace Palace, Binnenhof)
29-30-31 May 1-2-4-5 June	The Hague (Municipal Museum)
29-30-31 May 1-2-4-5 June	The Hague (Mauritshuis, Mesdag Panorama)
29-31 May 4 June	Aalsmeer
30 May 5 June	Koninklijke Begeer, Voorschoten (gold and silver industry)
1-3 June	Warmond (trip by water)
30 May	Poeldijk (auction of vegetables)
31 May	Gouda, Oudewater
	Afternoon excursions
29 May 5 June	Haarlem
29-30-31 May 1-2-4-5 June	Delft, Westland
1-4 June	Gouda, Oudewater
29-31 May 4 June	Rotterdam (Boymans Museum)
30 May 2-5 June	Warmond (trip by water)
	Whole-day excursions
1 June	Alkmaar, Edam, Volendam
29-30 May 4-5 June	Amsterdam (canals and shopping)
31 May 3-4 June	Arnhem (National Park)
30 May 2 June	Schiphol, Muiderslot, Soestdijk (Royal Residence)
3 June	Rotterdam, Dordrecht (windmill trip)

The cheese market at Alkmaar.

Marketing kerosine for household use.

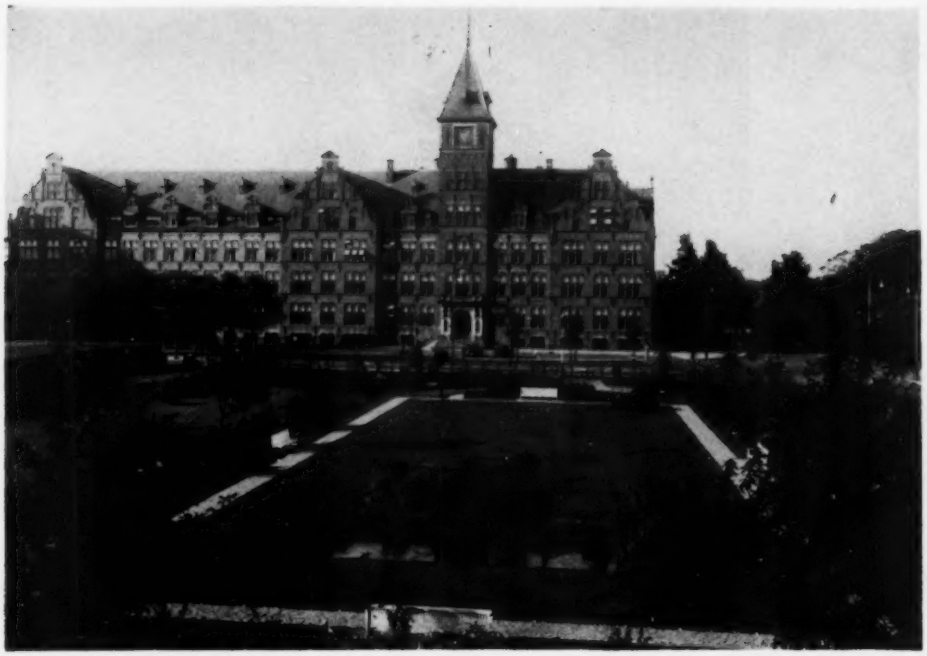
The tourist excursions are designed to appeal to ladies accompanying members of the Congress as well as the delegates themselves. Visits will be made to historic spots and structures, to museums and palaces but also to towns and villages off the beaten path which preserve the distinctive architecture of past centuries and where the costumes of an earlier period are still in vogue. In Amsterdam a boat trip will be taken through the winding canals of the city and an opportunity will be provided for visits to its many attractive shops. Among the many tours projected there are certain to be found some appealing to the most varied tastes. Scheveningen itself, where the Congress is to meet and where many of those in attendance will be quartered, is a delightful summer spot with its beaches and lovely outlook which have given it the title of "Pearl of the North Sea." A wide variety of entertainment is afforded by its restaurants, cabarets and other recreation centers.

One deep impression that will be carried away by every visitor who travels about Holland will be a feeling of astonishment and admiration of the wonderful work of restoration that has been accomplished by the Dutch people since the termination of the late war.

When one considers the state of desolation in which Holland was left at the end of the occupation, with its main port city largely destroyed, its food supplies looted, its cattle driven off, its factories stripped of their machinery, its bridges blown up and even its dykes cut to let in the sea and undo the work of decades, it is almost unbelievable that so few traces of this widespread havoc remains. Rotterdam has been rebuilt, its port facilities restored and a fine modern tunnel has replaced the bridge that once was a bottleneck to traffic moving to its docks and harbor. Cattle graze on green fields, the tulips bloom again in profusion, the factories have been reequipped, roads and bridges have been restored and the engineering work necessary to recapture its inundated areas is far advanced. In no other country perhaps than the land of the industrious and indomitable Dutch could so much have been accomplished in so short a time—and with so little outside assistance.

Volendam, where old costumes still are worn.

Sail boats on canal near the Kager Plassen.



Office headquarters of Royal Dutch Petroleum Co. at the Hague.

Aeilko Jansz Zijlker, whose concession in Langkat was the first asset of the "Royal Dutch."

J. B. Aug. Kessler, Sr., Managing Director (1892-1900).

Royal Dutch Shell

Holland's Great Oil Company

TO a visiting oil man Holland, in addition to its many historical and scenic attractions, has a special interest as the home of the Royal Dutch Petroleum Company. This Company, as the senior parent company of the Royal Dutch/Shell Group of companies, is well known all over the world and the Group's products are sold under the Shell emblem in almost all countries. The Royal Dutch/Shell Group has long ranked among leaders in the progress of the industry.

Last year the Royal Dutch celebrated its diamond jubilee, commemorating sixty years of activity with suitable ceremonies in the land of its origin. It was on June 16, 1890, that the company issued its first shares, bearing the somewhat unwieldy title of the "Royal Dutch Company for the working of petroleum wells in the Netherlands Indies" (Koninklijke Nederlandsche Maatschappij tot Exploitatie van Petroleumbronnen in Nederlandsch-Indie). King William III of the Netherlands showed his faith in the undertaking by granting the Company the title "Royal" from its inception, only to be considered "as a moral support" to the undertaking, as the decree said.

The purpose of the company and its place of operation was accurately set forth in its name, for it was established specifically to take over an existing oil field on the opposite side of the globe. Incidentally this official cognomen was retained long after the company had outgrown its original locale and activity. It gave way to the simpler appellation of "Royal Dutch Petroleum Company" only in 1948.

Apart from others such as Reerink and Stoop, credit for initiation of the oil industry in the East Indies belongs to an enterprising Netherlander named Aeilko Jansz Zijlker who was manager of the East Sumatra Tobacco Company. In the course of his inspection of the company's tobacco fields he observed that a scum collected from the surface of stagnant pools gave a particularly bright light to torches carried by the natives, much like that of the lamp oil that was then coming into use. Sensing the possibilities presented he obtained a concession from the Sultan of Langkat and proceeded with efforts to organize the production of oil. He did succeed in drilling some wells and proving the existence of oil in a field which was called Telaga Said, but which was to be much better known later on as Palankan Brandan. He found that more capital than he had available was needed to build a successful commercial enterprise. He turned therefore to the home country and transferred his holdings to the Royal Dutch Company organized by a group of Dutch businessmen and investors.

The beginning was a humble one and the attempt to make a place for Sumatra's oil in

Sir Henri W. A. Deterding, General Managing Director (1901-1936).

J. E. F. de Kok, General Managing Director (1936-1940).

J. B. Aug. Kessler, Jr., General Managing Director (1947-1949).

B. Th. W. van Hasselt, General Managing Director since 1949.

H. Bloemgarten, Managing Director since 1948.

Jhr. Dr. J. H. Loudon, Managing Director since 1947.

F. A. C. Guépin, Managing Director since 1950.

the growing petroleum trade encountered many difficulties. But in 1892 the appointment of Jean Baptiste August Kessler as managing director opened a new chapter. He introduced new methods, drilled more wells, increased the capacity of the refinery and placed operations on a businesslike basis. In 1895 the company paid its first dividend. The company was well set for expansion when Mr. Kessler died in 1900 in Italy on his way from the Indies back to the Netherlands, at the early age of 46.

Kessler's successor as managing director was a young man named Henri Wilhelm August Deterding who had entered the employ of the company in 1896 as sales manager and who is said to have been recommended in Kessler's will as his successor.

Deterding combined a mastery of detail with keen commercial sense and unbounded ambition. In the 35 years that he remained as operating head of the company, from 1901 to his retirement in 1936, the oil industry underwent a virtual revolution that multiplied the volume and variety of its products many fold and the Royal Dutch was always among the leaders in this expansion. Deterding was never one to shrink from a competitive struggle. With the consistent backing of an able and far-sighted board he extended the company's facilities and its marketing operations across seas and continents far removed from its first field of operation. When he took over as manager, the Royal Dutch already had substantial production and a refinery of sorts, but it was poorly equipped with transport. In the island of Borneo it was in competition with the Shell Transport and Trading Company, headed by Marcus Samuel. Shell itself was an oil producer with a concession in Dutch Borneo, but it was primarily a shipping company.

The relative situation of the two companies led first to joint operation in the field of sales by founding the Asiatic (now Shell) Petroleum Company and subsequently (1907) in a full amalgamation of interests, by which Royal Dutch acquired 60 percent and Shell 40 percent of the Bataafsche Petroleum Company, the Anglo-Saxon Petroleum Company and Shell Petroleum Co. Both the Royal Dutch and Shell Transport and Trading became holding companies, the three companies mentioned becoming major operating units. The Bataafsche was to carry on production and refining and the Anglo-Saxon to handle transportation. Thus was brought into existence the Royal Dutch/Shell Group, in which the parent companies, without sacrificing their separate identities, have worked together in the organization of hundreds of companies in different parts of the world.

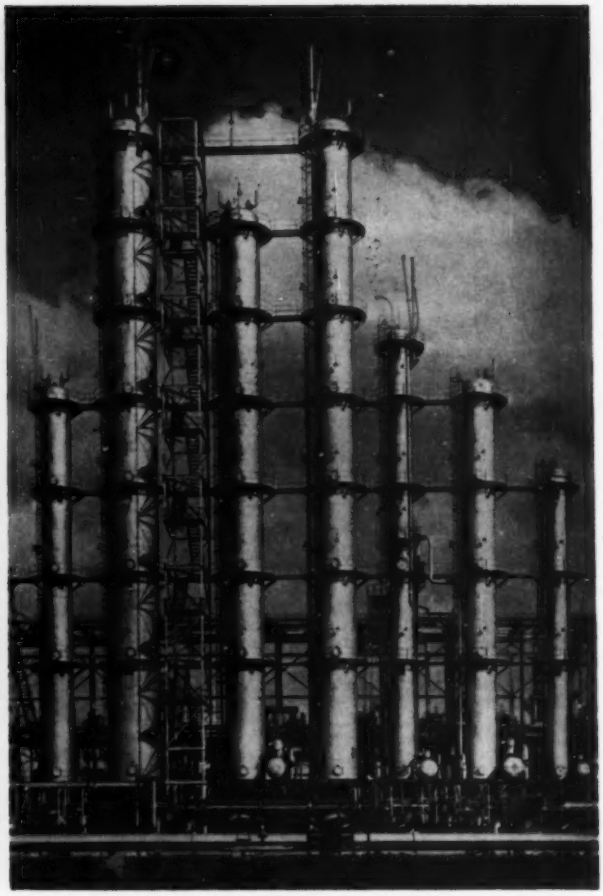
Under this unusual but practically effective financial set-up Royal Dutch/Shell extended its production from Indonesia to Russia, Roumania and Germany in Europe, to Iraq in Asia and Egypt in Africa. In the Western Hemisphere it established itself in Venezuela, Argentina and Colombia in South America and in Mexico, the United States and Canada in the northern continent. Its marketing activities are carried on in practically every country of the globe.

Typical of the daring, tempered by sound foresight, which has characterized many of the expansionist moves of Royal Dutch/Shell, was its entry into the United States in 1922. To invade the market stronghold of some of the world's greatest oil companies and the arena of competition for hundreds of producing, refining and marketing organizations betokened a high degree either of self-confidence or hardihood. The venture has prospered, however, and the Shell organization in the United States is among the top ranking oil companies in the country and wholly American in spirit and operation. One of the factors contributing to the success of the Royal Dutch/Shell Group in its expansionist progress has been its ability to adapt itself to the customs and commercial practices of the countries in which it operates and to the extent to which it has identified itself with the national welfare and social progress of these countries.

Like most large organizations operating in

Telaga Tunggal No. 1 (Sumatra) the first well of "Royal Dutch," 1890.

Drilling in the early days, South Palembang (Indonesia).

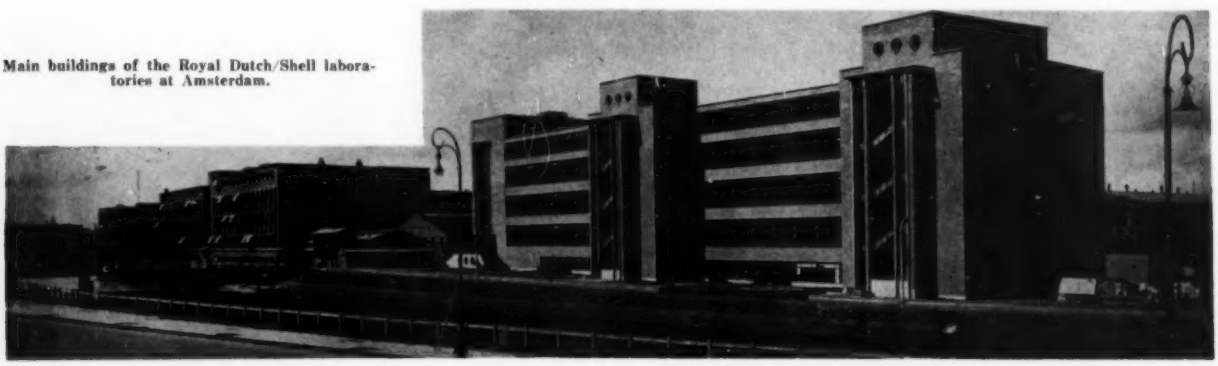


Alkylation unit in the Royal Dutch/Shell refinery at Curacao (Netherlands Antilles).

the international field, the Royal Dutch/Shell Group has had its set-backs. Its large Russian holdings were confiscated following the Bolshevist revolution of 1917. In Mexico where its subsidiary was the largest of foreign owned companies its properties were expropriated in 1938. It has been virtually ousted from Roumania since that country became a Soviet satellite. Meanwhile it sustained extremely heavy losses on both sides of the globe during World War II. Its strong and widely based resources have enabled it to survive these assaults and to repair most of the damage inflicted during the late war. At the present time it is producing or processing some 10 percent of the world's oil.

Although its activities have spread around the world, the roots of the Royal Dutch Petroleum Company are still strongly fixed in the country of its origin. Headquarters are still in the impressive if not entirely modern building at 30 Carel van Bylaandtlaan, The Hague. Its top management is always in the hands of Dutchmen and many of the influential board members who have helped guide the company's course have been outstanding figures in the business world of Holland. Successors to the elder Kessler and Sir Henry Deterding in the post of general managing director have been the distinguished engineer J. E. F. de Kok, the second J. B. August Kessler, son of the founder, and now B. Th. W. van Hasselt who for many years directed the im-

Main buildings of the Royal Dutch/Shell laboratories at Amsterdam.



View of Royal Dutch/Shell refinery at Rotterdam-Pernis.

portant activities of the Group in Venezuela. Among the joint managing directors one widely known to Americans has been J. C. van Panthaleon Baron van Eck, now retired, who contributed greatly to building up the organization in the United States. A name greatly revered in company circles is that of Jonkheer Hugo Loudon, who served for many years as chairman of the board. His son, John H. Loudon, is now a managing director.

While the Royal Dutch started its financial career with a modest issue of 1,300 (1000 guilder) shares, its nominal capital has since grown to upwards of 900 million guilders ($236,000,000 at current exchange). The first issue was all subscribed in Holland and a majority of the present share capital is owned by Netherlands citizens, attesting the confidence with which Dutchmen have supported the progress of their world famous company.

Holland always has been of special interest to the Royal Dutch. In addition to its central office at The Hague, a handsome building of modern design houses the Dutch marketing division of the company. Its great research laboratories at Amsterdam are supplemented by special laboratories at Delft devoted specially to the study of engines and their fuels. The company's Holland refinery is located at Pernis in the outer harbor of Rotterdam. It has been greatly enlarged in the past few years.

New plants for the production of chemicals (a synthetic detergent and a plastic of the P.V.C. type) have been erected on adjoining sites. The company operates a plant for the synthetic production of fertilizer at IJmuiden on the North Sea coast.

There is a feeling of particular pride among the members of the Royal Dutch family that the latest addition to the productive facilities of the company is in Holland itself. The oil field at Schoonebeek on the eastern border, though not of great size as compared with some others, is the largest single oilfield in western Europe and the first to be developed in the Netherlands. It now has about 125 wells and produced about five million barrels last year. It is held by N. V. Nederlandse Aardolie Maatschappij, owned jointly by the Standard Oil Co. (N.J.) and the Bataafsche Petroleum Mij (for the Group). It is operated by the latter and its output is transported by tank car trains to the company's plant at Rotterdam-Pernis for refining. A feature of the Schoonebeek field that is certain to impress the visitor from abroad is its park-like condition. Dutch devotion to order and cleanliness finds expression here. Once a well is completed and the derrick removed, the surrounding area is seeded and hedges of quick-growing shrubs are planted around the pumps. As observers have often remarked, it is undoubtedly the world's best dressed oil field.

Office of Royal Dutch/Shell marketing division, The Hague.

"Te Werve" Club, recreational centre for Royal Dutch/Shell personnel, near The Hague.

New Launchings and Tapline Completion Ease Tight Tanker Situation

Esso Springfield, night loading at Bayonne, N. J.

THE tight tanker situation created by the outbreak of war in Korea together with the sudden upturn in demand for petroleum products now has begun to ease. Barring the outbreak of a major world conflict it is not anticipated that another acute shortage of tankers will appear in the near future. Construction of new tonnage in the world's shipyards plus the laying of additional pipe lines is thought to be adequate to meet anticipated increases in demand. As of December there were 178 oil tankers under construction throughout the world. When complete these vessels will add nearly three million tons to the present 25.3 million ton fleet. Many of the newer tankers are of the high-speed supertanker class so that carrying capacity is increasing even more rapidly than the tonnage figures would indicate.

Pipe line construction has a substantial influence on the world demand for tankers. When Trans Arabian Pipe Line Co. completed its 1,068-mile line across Arabia last December the world supply of transport tonnage was in effect increased by 68-70 T2 ships. This was almost exactly the number of ships required by the military. Actually the effect was delayed beyond completion date of the line because of weather conditions which hindered loading operations at Sidon where tankers must anchor in the open Mediterranean to take on cargo. There is no land-locked harbor to protect shipping at this point. Deliveries of crude from Iraq to Tripoli in the late months of 1950 were increased to double the 1949 rate as a result of enlarged pipe line capacity in the northern leg of the IPC line. The southern branch to Haifa still was shut down for political reasons. Completion of the Interprovincial pipe line in Canada will have a minor effect on ocean shipping and it will not be until about the end of 1952 that the next big change in tanker demand will result from pipe line construction. That will be when the IPC completes its 26-32 inch 300,000-barrel line from Kirkuk to Banjas, Syria. This new line will displace 75 more T2 tankers.

Until the outbreak of hostilities in Korea the world market for tanker charters had been declining steadily for two and a half years. Caribbean to United Kingdom single voyage charter rates dropped from a high of about $21.50 per ton early in 1948 to about $6.50 at the end of 1949 and to $3.77 in May 1950. From June of that year onward the rates rose steadily through the latter half of 1950 to $10.64 and reached $19 by the end of the first quarter of this year. Since then the trend has been downward.

Similarly the rates from Ras Tanura to U.S. North of Hatteras which reached a low of $6.99 in June 1950, were up to $25.40 at the end of the year and $34.29 by March 1951. The latter rate was 170 percent of the USMC base rate. The Sidon-U.S. rate at $19.50 was 150 percent of the base.

The continued increase in the rates from Ras Tanura after opening of Tapline may be attributed partly to the weather which delayed loading at Sidon but more directly to the tremendous increase in world demand for petroleum for industrial and home use as well as for the military. In the latter half of 1950 military operations in Korea required about 25 tanker loads of petroleum products per month. Total military consumption in the second half of the year was about 51 million barrels, or less than 10 days supply at the present rate of domestic production in the United States.

More important than direct military demand is the tremendous increase in consumption created by the armament program in the United States and the general recovery pattern in Europe. In 1950 the level of world demand was about 11 percent above the previous year. Increase was on the order of 1,000,000 barrels daily. In the first quarter of this year it was running nearly 10 percent above 1950 or about 23 percent above 1949. First quarter demand reflects the heavy winter consumption and it may be anticipated that there will be some recession during the summer months. As mentioned above this already is indicated in the tanker charter market.

Shipping men do not view the future with apprehension barring the outbreak of a general war. If that should occur there would, of course, be an immediate dislocation of shipping to meet the emergency. The Korean conflict has resulted in the formation of a voluntary tanker pool in the United States at the request of military authorities. The pool will run until June 30, 1952, and is subject to renewal.

Industry response to the government's appeal was wholehearted. As of March 1, 53

Sovac Astral, new super-tanker of the Socony-Vacuum Oil Co., arriving at Port Socony in New York Harbor.

Tanker "Conoco Lake Charles" in Bolivar Roads.

U.S. companies had offered 369 ships to the pool with a total dead-weight tonnage of 5,876,124. This is equal to 88.3 percent of the tankers of 6,000 deadweight tons or more under the U.S. flag. The major portion of those not in the pool are under long-term contracts, engaged in Great Lakes shipping, or fitted out to carry liquids other than petroleum.

In addition to the U.S. tankers, 56-foreign-flag carriers owned by U.S. companies have been placed in the pool.

The pool is administered by a chairman who is a full-time employee of the Maritime Administration, aided by a six-member committee representing the tanker industry.

World construction of tankers is proceeding at a less rapid pace than at any time since the war. Greatest activity is in the United Kingdom and Sweden. United States building has almost halted. Only four tankers were being built at the end of 1950. Great Britain was building 97 and Sweden 23. Lloyds Register reveals the following construction by countries as of December 31, 1950:

	No. Vessels	Gross Tons
United Kingdom	97	1,146,364
Other British Commonwealth	2	24,000
Sweden	23	222,780
Japan	15	91,120
Holland	7	88,498
Norway	7	44,100
France	5	77,360
Denmark	5	48,150
Italy	5	45,200
United States	4	71,138
Belgium	4	43,736
Germany	1	1,500
Others	3	23,868
TOTAL	178	1,927,814

New keels laid down during 1950 were fewer than launchings. At the end of 1949 there were 320 tankers under construction or on order. Launchings during 1950 totaled 149 and, as indicated above there were 178 vessels on the ways at the end of the year. United Kingdom yards supplied 39 percent of tonnage launched in 1950, the United States 22 percent and Sweden 14 percent. Details of launchings as reported by Lloyds Register follow:

Where Built	No. Tankers	Gross Tons
United Kingdom	58	614,003
Sweden	24	219,124
United States	21	351,071
Japan	19	115,758
Holland	9	87,967
Denmark	5	50,006
France	4	55,497
Belgium	3	33,946
Canada	3	26,153
Germany	1	9,854
Spain	1	8,452
Portugal	1	7,416
TOTAL	149	1,579,247

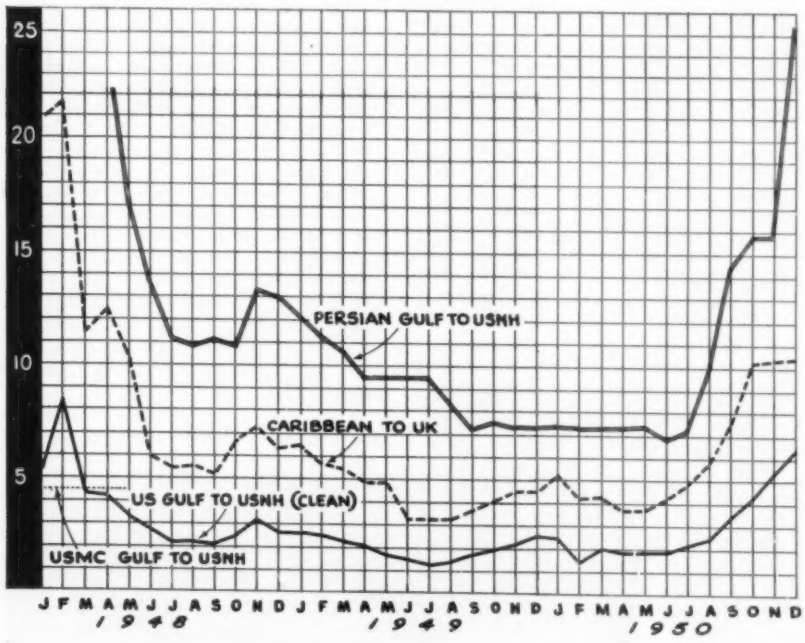
Booking of new tanker orders by British shipbuilders has been more active since the first of the year. In one week in February bookings on the Clyde totaled 13 with a dead weight tonnage of 243,000. The Norwegian government has granted permission for the construction of 13 vessels in British yards. British Tanker Co. is continuing its major building program, having let contracts for eight more vessels at a cost of £8 million, ($22,400,000).

Much of the construction in the United States since the war has been of 28,000 to 32,000 DWT supertankers for long haul service to the Middle East. All 21 launched in 1950 were steamers. The smaller ships launched in other countries were preponderantly motor driven. Of the 149 ships launched last year 110 were motor driven with a gross tonnage of 1,006,157 and 39 were steam driven with a gross tonnage of 573,090.

There were 40 ships in 1950 with a gross tonnage of 15,000 or more. Of these 32 were oil tankers. United States yards launched 19 of the supertankers, Great Britain 10, Sweden two and France one. The largest yet built is the 22,000-ton Juan Peron built at Belfast and the second largest the M.S. Berenice of 20,980 gross tons launched in France. Three of the United States built supertankers exceeded 19,000 gross tons.

First of the 28,000 DWT (18,600 gross tons) tankers to be built in the United Kingdom for Shell interests was the S.S. Velutina which was christened by Princess Margaret in April. In July two more of the Shell supertankers were launched within five days of each other for Anglo-Saxon Petroleum Co. The S.S. Verena slid down the ways at Belfast on June 29 and the S.S. Volsella at Birkenhead on July 4.

The British Tanker Co. of Anglo-Iranian launched its first 28,000 DWT (18,500 gross tons) tanker on December 12, 1950. The British Adventure is the first of six supertankers to be launched by the British Tanker Co. Directors are negotiating for the con-


25
20
15
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5
PERSIAN GULF TO USNH
CARIBBEAN TO UK
US GULF TO USNH (CLEAN)
USMC GULF TO USNH
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1948
1949
1950

Movement of tanker rates, 1948-50.

S. S. Jahra, typical of the 28,000-ton tankers constructed by Bethlehem Shipyards. Photo courtesy Bethlehem Steel Co.

SUPERTANKERS OF THE WORLD LAUNCHED IN 1950

Tanker	Deadweight	Owner	Builder
A. N. Kemp	28,074	California Transport Corp.	Bethelhem Sparrows PT. SY Inc.
Atholl McBean	28,074	California Transport Corp.	Bethelhem Sparrows PT. SY Inc.
Atlantic Engineer	30,155	Philadelphia Tankers Inc.	N.Y. S.B. Corp.
Atlantic Navigator	30,155	Philadelphia Tankers Inc.	N.Y. S.B. Corp.
Atlantic Seaman	30,155	Philadelphia Tankers Inc.	N.Y. S.B. Corp.
Berenice	31,000*	Cie. Aux. de Nav.	Chantier & Atelier St. Nazaire Penhoet
Bolette	24,000*	Fred Olsen & Co.	Harland & Wolff Ltd.
British Adventure	28,000	British Tanker Co. Ltd.	Vickers Armstrong Ltd.†
Bulktrader	30,004	Universe Tankships Inc.	Welding Shipyards Inc.
Caperata	28,281	Atlas Tankers Inc.	Bethlehem Steel Co.
Caprella	28,281	Atlas Tankers Inc.	Bethlehem Steel Co.
Caprinus	28,281	Atlas Tankers Inc.	Bethlehem Steel Co.
Capulus	28,281	Atlas Tankers Inc.	Bethlehem Steel Co.
Credo	24,500*	A/S Jensen's Rederi II	Vickers Armstrong Ltd.‡
Esso New York	26,786	Esso Shipping Co.	Newport News S.B. & D.D. Co.
Esso Santos	26,765	Panama Transport Co.	Newport News S.B. & D.D. Co.
H. M. Wrangell	24,850*	Skibs A/S Corona	Furness S.B. Cole Ltd.
Höegh Arrow	22,800*	A/S Noruega	Sir. J. Laing & Sons Ltd.
Juan Peron (Wale Factory)	27,000*	Compania Argentina de Pesca S.A.	Harland & Wolff Ltd.
Magwa	24,500*	Gulf Oil Corp.	Furness S.B. Cole Ltd.
Olympic Thunder	28,385	Olympic Oil Lines	Bethelhem Sparrows PT. SY Inc.
Paul Pigott	28,074	California Transport Corp.	Bethelhem Sparrows PT. SY Inc.
Robert Ward Miller	28,000*	California Transport Corp.	Bethelhem Sparrows PT. SY Inc.
Sovac Comet	27,025	Tankers Navigation Co. Inc.	Sun Shipbuilding & Dry Dock Co.
Sovac Daylight	27,028	Tankers Navigation Co. Inc.	Sun Shipbuilding & Dry Dock Co.
Sovac Radiant	27,031	Tankers Navigation Co. Inc.	Sun Shipbuilding & Dry Dock Co.
T. S. Petersen	28,074	California Transport Corp.	Bethelhem Sparrows PT. SY Inc.
Tank Emperor	24,380	Skibs A/S Oil Express	Kockums Mek Verksted
Tank Empress	24,380	Skibs A/S Tankekspress	Kockums Mek Verksted
Velutina	28,330	Anglo Saxon Pet. Co. Ltd.	Swan Hunter & Wigham Richardson
Verena	28,000*	Anglo Saxon Pet. Co. Ltd.	Harland & Wolff Ltd.
Volsella	28,000*	Anglo Saxon Pet. Co. Ltd.	Cammell Laird & Co. Ltd.

*Estimated
†Barrow in Furness
‡High-Walker-On-Tyme

TANKERS UNDER CONSTRUCTION OR ON ORDER

December 31, 1950

Where Building	No.	Gross Tons
Belgium	6	68,216
Canada	3	39,000
Denmark	15	152,452
France	5	75,800
Germany	12	110,317
Great Britain	168	1,994,440
Holland	18	220,749
Italy	5	75,600
Japan	19	131,770
Norway	22	193,041
Spain	8	35,184
Sweden	70	826,080
United States	6	94,500
Total	357	4,017,149

Table courtesy of Shipbuilders Council of America

SUMMARY 1950-1949 FIXTURES

Average Rates for 1950-1949 Based on Single Voyage Charters U. S. Gulf to U. S. N. H.

	1950		1949	
Month	Clean	Dirty	Clean	Dirty
January	$2.42	$1.83	$2.75	$2.43
February	1.43	1.51	2.57	2.33
March	2.00	1.82	2.22	2.04
April	1.89	1.68	2.07	1.94
May	1.90	1.77	1.71	1.69
June	1.95	1.76	...	1.35
July	2.18	1.92	1.28	1.28
August	2.59	2.48	1.36	1.33
September	3.46	3.60	1.81	1.58
October	4.22	4.25	1.99	1.88
November	5.31	4.77	2.22	2.10
December	6.37	5.98	2.66	2.37
AVERAGE	$3.21	$3.02	$2.21	$2.01

Based on all reported single or two consecutive voyage fixtures in U. S. currency, whether American or foreign flag, any size; Caribbean/USNH fixtures included, but converted to U. S. Gulf/USNH basis.
Table prepared by Deitze, Inc. oil and ship brokers and ship chartering agents, New York, N. Y.

struction of some even larger tankers of about 32,000 deadweight tonnage.

A recent review of the British Tanker fleet's history in The Naft, house magazine of Anglo-Iranian Oil Co. highlights the trend in tanker capacity since the company was formed in 1915 during World War 1. The company's first tanker launched in 1916 was of 5,796 DWT. Capacity had been doubled to 12,262 by 1936 and by 1948 the standard ocean tanker was up to 16,150 DWT. British Tanker's proposed new ships will be more than six times as large as the World War I vessel and twice as large as the World War II tanker.

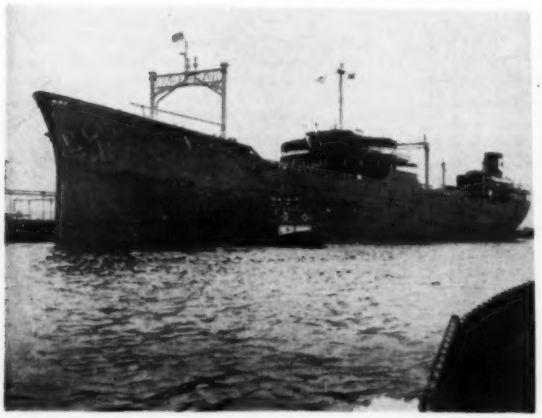
The Naft review also suggested how major fleets have grown in overall size in recent years. Since 1948 Anglo-Iranian has been spending £8 million per year for tankers. The company now has 159 vessels in commission and building. Present carrying capacity is 1,660,000 DWT and ships now building will increase this to two million tons. The company also charters many ships owned by others. There are now 37 being built for other owners which will be chartered for long terms by British Tanker Co.

The pattern of world flow of oil to market is changing at a rapid rate and this change will have a considerable effect on tanker demand and tanker movement. Principal movements of oil in world trade are: U.S. Gulf to Atlantic Coast; Caribbean to United States and Canada; Caribbean to Europe; and Middle East to the Orient, Europe and the United States. United States exports to Europe formerly were very large but are declining now as the Middle East expands.

Before World War II the eastern hemisphere consumed nearly 36 percent of the world's oil and produced only 22.5 percent. Today Eastern Hemisphere production is 28 percent of the world's total and consumption about 30 percent of the total. Some cross hauling is inevitable in a free world trade but the main flow is tending to remain within hemispheric limits. Latin American oil is tending to supply the North American deficiency and the cross Atlantic flow is diminishing. There is considerable movement of Middle East oil to the United States in vessels which then sail to the Caribbean to pick up a cargo of oil for delivery to Europe.

Despite such hauls dictated by exchange considerations and the exigencies of ownership the overall trend may be expected to be a reduction in long hauls between hemispheres and a reduction in the overall length of voyage. Demand for peacetime ocean tonnage probable will not expand as rapidly as demand for oil itself so that the current rate of construction may be considered adequate to keep the world fleet at a satisfactory level.

Sovac Daylight, super-tanker of the Socony-Vacuum Oil Co., built by Sun Shipbuilding and Dry Dock Co.



View of tanker dock at the Gulf Refinery, Port Arthur, Texas.

First South American Oil Congress

AFTER long delays and much effort on the part of its promoters the first Congress of the South American Institute of Petroleum (ISAP) was held in Montevideo, March 12 to 17, 1951.

This Congress was to have been held in Lima, Peru, in the year 1948, but for reasons wholly beyond control of the authorities of ISAP it had to be postponed from one year to another. At length the permanent council of the Institute at its sixth annual meeting in Montevideo decided to hold the Congress there.

Representatives of 15 American countries attended: Argentina, Bolivia, Brazil, Canada, Colombia, Chile, Ecuador, United States of North America, Guatemala, Mexico, Panama, Peru, the Dominican Republic, Uruguay and Venezuela. These countries sent a total of 110 delegates. The Canadians and North Americans were present as observers. The French Institute of Petroleum sent a delegate.

The program of the Congress included 60 papers on geology, exploration, production, refining, chemistry, transport, utilization, safety, and instruction in the petroleum industry. No previous Latin-American gathering of petroleum interests ever covered such an extended field of discussion. A major portion of the program was on the geology and production of oil, and the utilization of bituminous schists presented by delegates of Argentina, Bolivia, Brazil, Colombia, Chile, Ecuador, Peru, Mexico and Uruguay. The council of the ISAP is preparing these papers for publication in its bulletin.

In the preliminary assembly the first act of the delegates was to elect unanimously the members of the organizing committee as the official board of the Congress. These were Carlos R. Vegh Garzon, president; German E. Villar, secretary; Tydeo Larre Borges, treasurer; Salvador Masson and Ernesto Peluffe, directors. The next act was to extend thanks to the government of Uruguay, which contributed liberally toward the expenses of the Congress, and to other governments, institutions, oil companies that sent delegates and otherwise lent their support.

In the inaugural session addresses were made to point out the importance of periodical gatherings for the exchange of information and ideas among those interested in the petroleum affairs of the South American continent. These were followed by an address by Bernardo Rikles, secretary general of the ISAP and technical assessor of the energy division of the Argentina Ministry of Industry and Commerce, whose thesis was "Conservation and Utilization of Power Resources, Especially Those That Are Not Renewable."

Mr. Rikles divided his subject into eleven parts, representing the objectives toward which a sound petroleum policy should work. First, he put the maximum extraction of the oil of a reservoir from carefully drilled wells, and conservation of the potential energy of the reservoir by sound methods of production. Second, he discussed the industrialization of crude oil from the point of view of maximum production of distillates, pointing out that the primary distillation of crude oil should be combined with cracking for maximum production of fuels for internal combustion engines, and with vacuum distillation and solvent refining for the production of lubricants. Third, for the overall most advantageous use of petroleum the consumption of fuels for the power systems of electrical utilities, in industry and transport, should be reduced and the efficiencies of these systems raised so as to economize this kind of fuel. It is important that the collaboration of educational institutions and technical associations should be enlisted to accomplish this end.

Fourth, electric power plants should use renewable resources or solid fuels. Where practicable use should be made of exhaust steams for heating and processing. Fifth, the use of solid fuels for the generation of steam and industrial furnaces generally should be intensified, leaving the combustible liquids for certain specialized industries and to supply the essential needs of transportation services. Sixth, Diesel engines should be favored for the mass transportation of passengers and freight. Seventh, moderation is to be recommended in the use of heavy cars as a means of conserving fuel for the use of the average automobilists. Eighth, Diesel tractors should be used in agricultural field work in all cases that allow a reduction of operating costs. Ninth, in regions having access to reservoirs of natural gas, this fuel should be used as far as possible in the service of local automotive transport. Tenth, railway service should be used as far as possible in the service of local automotive transport. Tenth, railway service should be modernized from the point of view of utilization of local power resources, using Diesel traction, hydroelectric power, gas turbines, and generator gas, when these resources reach the possibility of commercial development. Eleventh, in large cities, use should be made of domestic residues and sewer gas for the production of electric power.

The succeeding days were occupied in the discussion of papers presented before the various section meetings and general sessions. On the 16th the Congress was addressed by the president of the Uruguayan House of Representatives and the Minister of Industry and Labor, who gave a resumé of the work of the Congress and its significance for the technical development of the petroleum industry of the American peoples.

Then followed an address by a Mexican delegate, Francisco Inguanzo Suarez, assistant director of Petroleos Mexicanos, who spoke on "Problems of Producing Petroleum in Mexico" and outlined the forms in which solutions were found for the oil production problems of his country and the training of Mexican personnel for taking over all industry operations. Mr. Inguanzo offered the technical collaboration of his country in an exchange of petroleum engineers with the other American countries in order to enlarge the experience of all in coping with problems of petroleum technology.

Along much the same line a Peruvian delegate, Manual B. Llosa, director of the National Engineering School in Lima, took the floor with an address on "Inter-American Coordination in the Study of Technological and Economic Problems of the Petroleum Industry." He listed a number of technical problems of a general character that might be solved with advantage by collaboration between technologists of the various countries. First of all he had in mind such meetings as this one, and closer relations between the petroleum institutes of the American countries, by which they might co-ordinate their actions for the benefit of the whole industry.

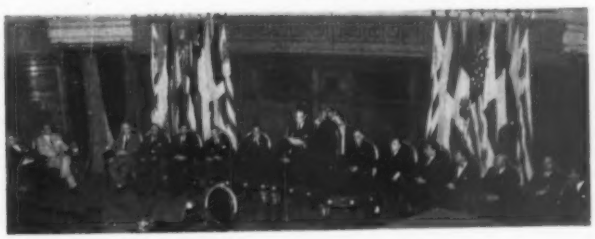
The proceedings were followed by a visit to the refinery of ANCAP at Las Tejas, where the visitors were entertained with a barbecue.

Carlos R. Vegh Garzon, President of the Congress.

German E. Villar, Secretary-General.

Preliminary meeting of the Organizing Committee.

Opening session of the Congress at the National University of Uruguay.



South Africa Refineries Planned to Meet Rising Demand for Products

TWO major projects to manufacture internal combustion engine fuels in the Union of South Africa have been made public in recent weeks. Standard-Vacuum Oil Co. has announced that it will erect a $12.5 million oil refinery at Durban which will process 10,000 barrels of Saudi Arabian crude daily. The second project is not a petroleum refinery. It is a $50 million Fischer Tropsch type plant to be built by the South African Coal, Oil and Gas Corp. (SASOL) for the production of gasoline and diesel fuel from coal. SASOL is a government sponsored company.

Combined production of the two undertakings is estimated at about 20 to 22 million barrels of fuels per year. The coal-to-oil plant which will be built by the M. W. Kellogg Company's international subsidiary will produce 16 to 17 million barrels of products or about 60 percent of the present domestic consumption in the Union. Originally a smaller plant costing about $36 million was planned but engineering studies suggested that a 40 percent increase in plant cost would double the output and bring costs more in line with those of production from crude oil. The plant is scheduled for completion in 1955.

At present there is no petroleum refinery in South Africa. The Standard-Vacuum installation will be the first. There has been, however, production of about 200,000 barrels per year of motor gasoline and bitumen from torbanite shale at a plant near Johannesburg. Operating company is the South African Torbanite Mining and Refining Co. (SAMTAR).

It is stated that the government will not find it necessary to subsidize the coal-to-oil operation in South Africa by a tax differential. SASOL products will pay the 9d tax imposed on petroleum fuels. Ability to operate in competition with motor fuels produced from crude oils rests on the fact that South African coal is said to be the cheapest in the world, costing on the order of 5s per ton. Estimates are that nine tons of coal costing about $6.30 (U.S.) will produce about eight barrels of motor fuel.

Installation of the new oil refinery and the coal-to-oil plants will be particularly welcomed by the Union of South Africa because of the saving in foreign exchange. The economy of the Union has been booming since World War II but exchange continues a problem there as in many other parts of the world.

Manufacturing enterprise is growing in a good many lines with the result that the Union is less dependent than formerly on imported goods. There now are more than 1,500 manufacturing establishments with a production valued in excess of $200 million. This is more than double the output of privately owned manufacturing plants a decade ago.

In all industrial undertakings in the Union 500,000 persons are employed to produce goods and materials valued at $1 billion annually. This is a 400 percent increase since World War I.

Growth of population has been particularly rapid since World War II. Europeans increased 31.6 percent in number between the census of 1936 and 1946. Since then the growth is estimated to have been even more rapid. Even so the Ministry of Labor headed by B. J. Schoeman is seeking to increase the supply of skilled workers from Europe by encouraging young apprentices to leave their homelands and finish their training period in South Africa.

Increases in petroleum consumption are due partially to normal trends in economic and social development and partially to the development of secondary industry. Largely a gold and diamond economy in the past, the Union is developing transport, agriculture, manufacturing and the mining of other minerals to the extent, where, in 1950, other exports from the Union exceeded gold exports. Output of secondary industries has jumped nearly 90 percent since 1939.

At the same time gold mining, the primary industry, continues to produce some $400 million worth of gold a year, about 35 percent of world output. New discoveries in the Orange Free State indicate the possibility of half again as much gold production by 1960.

In spite of ample supplies of cheap coal, transport in Southern Africa is an increasingly important petroleum consumer. The Union of South Africa particularly is bettering its internal communications through long-term roadbuilding programs. Its 12 million people are scattered over 472,500 square miles, 30 percent of them in widely-separated cities. Highway transport is bearing the weight of increased private and commercial usage and, since 1939, motor vehicle registration increased from 370,000 to 611,000 in 1949. Registrations by types of vehicles since 1945 are given in Table I.

Air transport both international and local, has shown a considerable increase, reflected in the consumption of aviation gasoline. In 1949 South African Airways carried two million passengers compared with 37,053 in 1939. The internal airways network is operated over a 5,354 mile route with 144 flights a week. The Airways has operated profitably with a seat sale equal to about 70 percent of capacity.

Because of the abundant local supply of low cost coal the Union of South Africa is not a large consumer of fuel oil except for bunkers. In 1950 marine fueling of ships calling at Union ports required four million barrels. The new Standard-Vacuum refinery will be an important source of fuel for marine operations when it is completed late in 1953 or early in 1954. The plant will be operated principally as a producer of fuels ranging from gasoline to heavy bunker oils.

Agriculture in South Africa is becoming more mechanized. Present estimates show some 45,000 tractors in the Union alone, fueled mainly by power kerosine. Major export items are tobacco, cotton, citrus fruit, wool and hides, sugar and sisal.

Four major oil companies operate in Southern Africa: Atlantic, Shell, Caltex and Vacuum Oil Company of South Africa, Ltd., a Standard-Vacuum subsidiary. Important deep-water importing terminals are maintained at Durban, East London, Port Elizabeth and Capetown in the Union; at Beira and Lourenco Marques in Mozambique; and at Mombasa in Kenya and Walvis Bay in South West Africa. Inland throughout the Union are about 15 main distribution depots such cities as Pretoria, Johannesburg and at Kimberley and Bloemfoentein. There are other depots outside the Union, including Windhoek in South West Africa; Salisbury and Bulawayo in Southern Rhodesia; Nairobi in Kenya and at several smaller points in East Africa. Since the country has no inland waterways, all distribution is via the government-owned and operated railways. Virtually all retail outlets are privately-owned and carry all of the major brands at the same outlet.

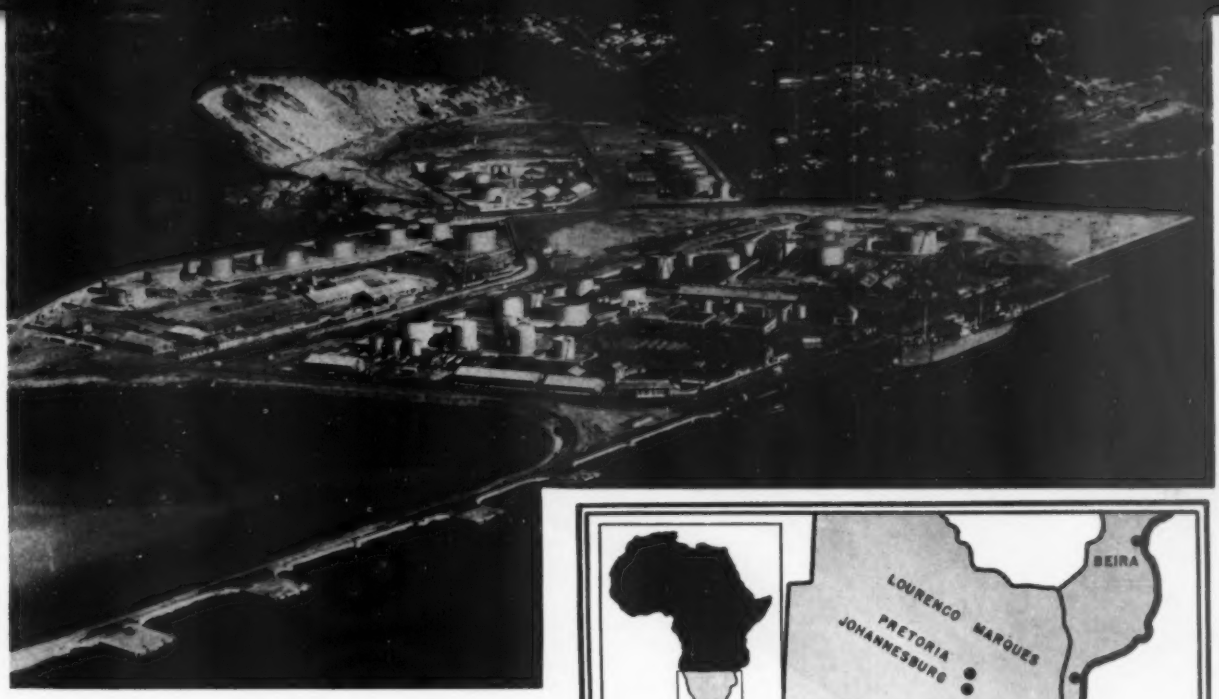
In 1950, motor gasoline accounted for approximately half of all products sold. Automotive diesel power and illuminating kerosine sales were in the vicinity of two million barrels each. Other products sold included aviation gasoline, industrial diesel oil, lubricants, greases, wax and candles, naphthas and solvents.

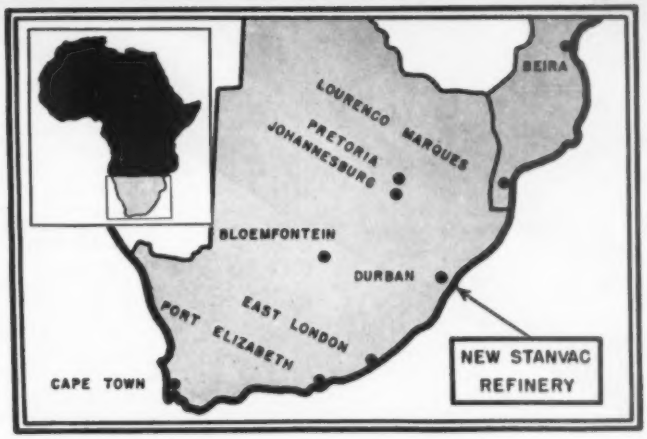
The pioneer oil company in the Union, Vacuum Oil Company of South Africa, Ltd., Standard-Vacuum subsidiary, has been a marketer there since the 1890's with its main office at Capetown. The company maintains branch offices throughout South and East Africa. In addition to the Union of South Africa area, Vacuum markets also in South West Africa; the Rhodesias, Nyasaland, Kenya, Uganda, Tanganyika, Portuguese East Africa and the islands of Ascension, St. Helena, Mauritius, Reunion and Madagascar. In some of these areas, notably the Rhodesias and Nyasaland oil consumption has more than doubled in the past six years. Tractor registration in Southern Rhodesia has tripled in the past three years.

Altogether, Vacuum covers some millions of

J. B. Nolan, managing director, Vacuum Oil Co. of S. Africa Pty., Ltd.

Bryant F. Kenney, managing director, Standard-Vacuum Refining Co. Ltd.





Island view at Durban with tanker discharging at Vacuum pier.

Photos courtesy Standard-Vacuum Oil Co.

square miles of territory with a population of 55,000,000. Throughout its area, the company operates seven ocean terminals, and its products are sold through 50 inland depots. Can plants are operated at Capetown and Durban.

Durban, which was selected as the site for the Standard-Vacuum South African refinery, is the third largest city in the Union with 373,800 inhabitants. With a fine climate similar to that of California the city is a vacation as well as an industrial center.

Selection of Durban as the site was due amongst other factors to the deep-water facilities for tankers which will bring the refinery's crude to that port. Vacuum already has a marine terminal at Durban; this will be expanded and will eventually be connected with the new plant by a four and one-half mile pipe line through which the crude will move to stills. While it is too early at this time to designate a definite source of crude, the Persian Gulf area presents one obvious possibility. Finished products will move out of the refinery principally by road and rail to Vacuum's distributing points in the Union.

Announcements of the plans to build the new refinery were made at Capetown in a joint statement by government officials and Vacuum. It was stated that a new company had been formed, Standard-Vacuum Refining Co. of South Africa, Ltd. Actual site of the plant will be a 214-acre tract at Wentworth, an industrial suburb of Durban.

The plant still is in the engineering phase. General character of the refinery has been settled, however. When final designs for the refinery are completed it is expected to embrace several new principles, and will probably consist of a single integrated unit in which will be combined the functions of distillation, naphtha reforming, and fluid catalytic cracking. The usual facilities for chemical treating, storage tanks for working stocks, shops, laboratories and administrative offices will complete the installation.

Heading the entire project will be Bryant F. Kenney, until recently assistant general superintendent at Esso Standard Oil Company's Bayway refinery near Linden, New Jersey. Mr. Kenney recently joined the Standard-Vacuum organization and the new company now has opened its offices at Durban. He has been designated managing-director of Standard-Vacuum Refining Company of South Africa, Ltd. His background of more than 20 years in the United States petroleum industry has given him experience in all major phases of oil manufacturing operations.

As the assistant administrative head, and acting head for periods totaling nearly eight months, Mr. Kenney was engaged at Bayway in the coordination of all process, mechanical and technical functions of a refinery employing more than 4,000 persons and capable of charging some 135,000 barrels of crude oil each day. In this assignment and in a variety of earlier jobs, he obtained a broad understanding of supply, labor, economic and other problems involved in petroleum refining.

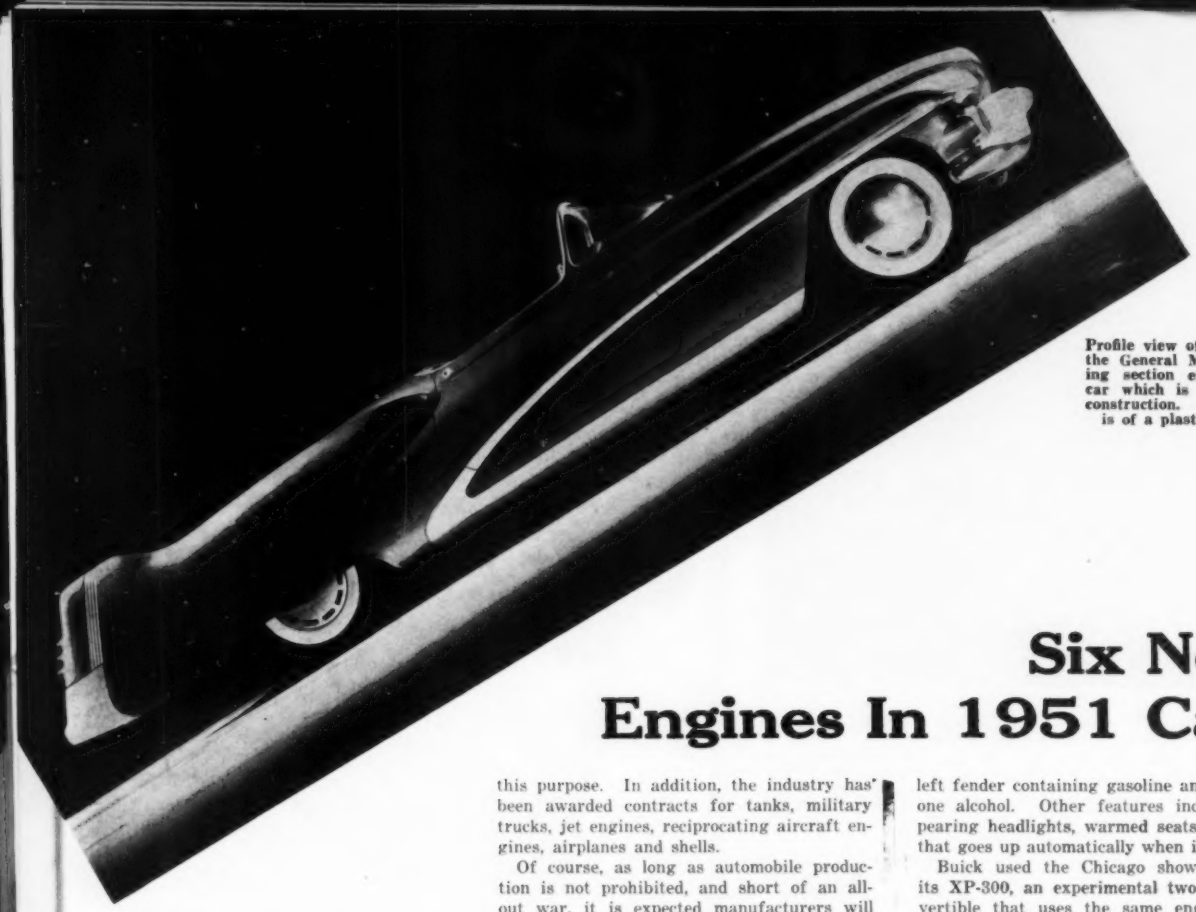
A graduate of Massachusetts Institute of Technology where he received a bachelor of science degree in mechanical engineering in 1930, Mr. Kenney immediately joined Esso Standard as student engineer. His first job was as instrument man on one of the large processing units at Bayway. He then moved successively into cost analysis work, general and special processing of petroleum derivatives, and process supervision and coordination. During World War II he coordinated the receiving, unloading, storage and transfer of petroleum products at the Bayway plant and its associated Bayonne refinery nearby for the United States Navy's petroleum pool in the New York area. This was a special and complex task having high priority in the war effort.

J. B. Nolan, as chairman of the board and managing director of the Vacuum Oil Company of South Africa, Ltd., directs the marketing operations of that company throughout Southern and East Africa. A veteran of 40 years international petroleum experience, Nolan became head of Standard-Vacuum's South African subsidiary in February, 1950, and is Vacuum's first South African-born managing director. He joined the company in South Africa in 1911. After various sales and administrative positions in the Union, London and New York, Mr. Nolan became a director of Vacuum, South Africa, in 1941. He relinquished this position in 1947 to come to New York as area consultant for South and East Africa, the post he held prior to returning to the South African company.

Table I

SOUTH AFRICAN MOTOR VEHICLE REGISTRATIONS

	Motor Cars	Commercial Buses	Commercial Vehicle	Motor Cycles	Total
1945	288,035	2,506	73,130	20,064	383,735
1946	307,166	2,998	84,282	22,874	417,320
1947	354,201	3,843	97,063	22,747	477,854
1948	417,015	4,310	119,146	23,684	564,155
1949	454,688	4,939	128,478	24,286	612,391



Profile view of Le Sabre, the General Motors styling section experimental car which is now under construction. Photograph is of a plaster model.

Six New Engines In 1951 Cars

LAST year the American automobile industry surpassed all previous records. One out of every ten passenger cars on the road under ten years old was a 1950 model, and registrations reached about 40 million or nine percent more than in 1949. The number of passenger cars produced in 1950 amounted to 6,672,700 while trucks and busses totaled 1,343,050. This activity is reflected in the annual report of General Motors which reported the highest net income in 1950 ever earned by a single company, a net of over eight hundred million dollars. Other manufacturers too profited from the great demand for automobiles as did innumerable suppliers to the auto manufacturers.

This year will not compete with 1950 as far as passenger car output is concerned, and it is hard to predict when the record of 1950 will be matched. The most optimistic estimate would be in 1953 if war does not interfere, for by that time the steel capacity of the United States is expected to be sufficient to permit civilian consumption to equal that of 1950. Presumably the production of other strategic materials such as aluminum, copper, and rubber will have been boosted proportionately.

The automobile industry entered 1951 in a state of confusion and uncertainty. The government has not stopped the manufacture of new cars, but it has placed restrictions on the strategic materials that may be allocated for this purpose. In addition, the industry has been awarded contracts for tanks, military trucks, jet engines, reciprocating aircraft engines, airplanes and shells.

Of course, as long as automobile production is not prohibited, and short of an all-out war, it is expected manufacturers will be permitted to make as many cars as they have materials for. As a result there will be a trend toward finding substitute materials and a tendency to stretch available supplies as far as possible. An example of this is seen in the 1951 Buick Special which is the first car to come out with cast iron piston rings because of the scarcity of aluminum. This car is also the first in the Buick line since 1934 that emphasizes a reduction in weight, a trend that may have been brought on by the allocation of materials.

No announcement has been made in New York of a showing of 1951 models as has been the custom in previous years. Last year, for example, there was the all General Motor's show at the Waldorf Astoria hotel and numerous other showings, including the British Automobile Show at Grand Central Palace. But in spite of the lack of fanfare, there are 1951 models, most of which were displayed at a show in Chicago in February. The manufacturers have spent some $500,000,000 in the preparation of their new models with the result that there are 18 new lines for 1951 and six new engines. In addition, General Motors showed two pilot models that may point the way toward the car of the 1960's.

The first was the "Sabre," an experimental car incorporating many radical advances that can be used in cars of the future. The engine in the "Sabre" develops up to 300 hp. and is a V-8 employing alcohol injection. Every effort has been made to use lightweight alloys in its construction, even in the engine block. As a result, it weighs about the same as today's Ford and Chevrolet. Fuel tanks are built into the rear fenders, the left fender containing gasoline and the right one alcohol. Other features include disappearing headlights, warmed seats, and a top that goes up automatically when it rains.

Buick used the Chicago show to exhibit its XP-300, an experimental two-seater convertible that uses the same engine as the "Sabre." The body is made of aluminum and is 39 inches high. Top speed is 150 miles an hour.

This year there appears to be a shift toward the V-8 engine and the "Sabre" and XP-300 are apparently using a high-powered version of the engine that may all but replace the in-line engine in the next ten years. So far, Chrysler, Studebaker and Oldsmobile have come out with new V-8 engines, and it is reported that other manufacturers are ready to put this type of engine in their new models. Other new engines announced this year include the 145 horsepower Hudson Hornet, a large but simple six cylinder engine that uses regular grade gasoline; and two new engines that are optional on the Henry J the new short-wheel base car that joined the Kaiser line this year. These engines, made by Willys Overland are either four or six cylinders, and develop 68 and 80 horsepower respectively, with a 7-to-1 compression ratio.

The Chrysler "Fire Power" engine is an advanced V-8 type, and is claimed to operate satisfactorily on regular grade gasoline although the compression ratio is 7.5-to-1. The engine is rated at 180 horsepower at 4,000 rpm. and the displacement is 331 cubic inches. The outstanding feature of this engine is the dome-shaped combustion chambers and the angle-mounted valves which contribute greatly to improved efficiency. This engine is only used on the Chrysler Imperial and the New Yorker.

Another development that Chrysler is offering in its high priced models is power steering which greatly improves the manoeuverability of a heavy car. Power is applied to

the steering mechanism by a hydraulic plunger connected to the steering linkage. Oil under pressure is pumped to the piston by a pump driven by the fan belt. The action of the steering wheel opens and closes a valve that regulates the pressure to the piston. In the event the oil pressure should fail, manual operation is possible and automatic through the steering wheel.

All Chrysler cars for 1951 use a new tubular-type shock absorber called Oriflow. It is designed to give uniform damping of road vibrations on all kinds of roads. More positive control of the springs results from the metering of the oil in the shock absorber through passages rather than valves.

The trend toward automatic transmissions that was so evident in the 1950 models has continued and the Plymouth is the only car, with the exception of the two new small cars, the Nash Rambler and the Henry J, which does not offer automatic or semi-automatic shifting as optional equipment. The Hydra-matic transmission used on the Pontiac has been redesigned to facilitate quick shifting into reverse with the result that for the first time it is possible to rock a car with this type of transmission. This feature is desirable if the car becomes stuck in mud. Packard's Ultramatic torque converter was introduced in 1950 and has proved to be very acceptable. It locks into a direct mechanical drive at slightly below 20 miles an hour. It is standard equipment on the Packard "400" models.

The two newcomers in the low price field, the Henry J and the Nash Rambler, have created a great deal of interest but it is too early yet to know now how they will be accepted by the public. The four cylinder Henry J is the lowest priced full-size sedan on the market, selling at $1299 F.O.B. factory. The six-cylinder model is listed at $1429 which is about the same or even a little higher than the six-cylinder Ford or Chevrolet (two door sedan models). Kaiser has kept the price of the four low by stripping it of all non-essential details, such as arm rests and cigarette lighters, and by making access to the luggage compartment over the back of the rear seat not too convenient an arrangement. This same luggage arrangement is found in the six.

The Nash Rambler, like the Henry J, has a 100-inch wheelbase and weighs about 2700 pounds which is approximately the same as the Henry J six. It uses a six-cylinder L-head engine that develops 82 horsepower at 3800 rpm. The compression ratio is 7.25-to-1. Tests show it will give over 30 miles per gallon which is probably better than any other full-size car on the road today. It sells for as much or more than the Ford and Chevrolet and it is therefore not competitive with the Henry J from a price point of view. But it is a car that has appeal to those who want an economical car that is well designed and that has good styling. The convertible sedan has the advantage of roof rails that are always in position and that act as stress-bearing members, increasing rigidity and reducing total weight.

For 1951, Buick is offering four cars, the Special, the Special Custom, the Super and the Roadmaster. The 1950 Special, which was mentioned above, is now the Special Custom and the new Series-40 Special is an addition to the Buick line. The Series-40 is the smallest Buick, having a wheelbase of 121.5 inches. It uses an eight-cylinder engine developing 128 horsepower at 3,600 rpm. The compression ratio is 7.2-to-1. Optional on all Buick's this year is the E-Z-Eye windshield that was developed for Buick by one of the leading glass manufacturers. This glass is tinted to reduce the glare of the sun and is so designed that the color increases gradually toward the top.

Oldsmobile has further improved the "Rocket" engine by redesigning the combustion chamber to help capitalize on the compression ratio of 7.5-to-1 even if premium fuel octane numbers are lowered. The new compact shape of the combustion chambers will shorten the flame travel, it is claimed, and provide a more effective "quench area" above the pistons. Fuel economy has been increased by using a down-draft carburetor with a vertical air inlet. This also facilitates faster starting in cold weather and quicker starting after heavy duty operation. Other refinements include a newly designed distributor, silicon rubber insulated spark plugs, and a redesigned ignition harness.

In general it may be said the 1951 models of most manufacturers carried on and further improved the refinements that became so evident in the 1950 models. From the mechanical point of view the most outstanding advance is the new Chrysler V-8 engine that develops one horsepower for each 5.13 pounds of engine weight compared with one horsepower for each 7.42 pounds of engine weight on the previous 135 horsepower Chrysler in-line engine. Also evident in 1951 is a trend toward the V-8 engine that may justify the position taken by Henry Ford in the early thirties.

The emphasis on gasoline economy is seen in a comparison of records of the 1951 Mobilgas economy run compared with those of the previous year. This year the average of all cars entered was 23.9 miles per gallon compared with 22.074 miles in 1950 according to American Automobile Association records of the 840-mile test run sponsored by General Petroleum Corp.

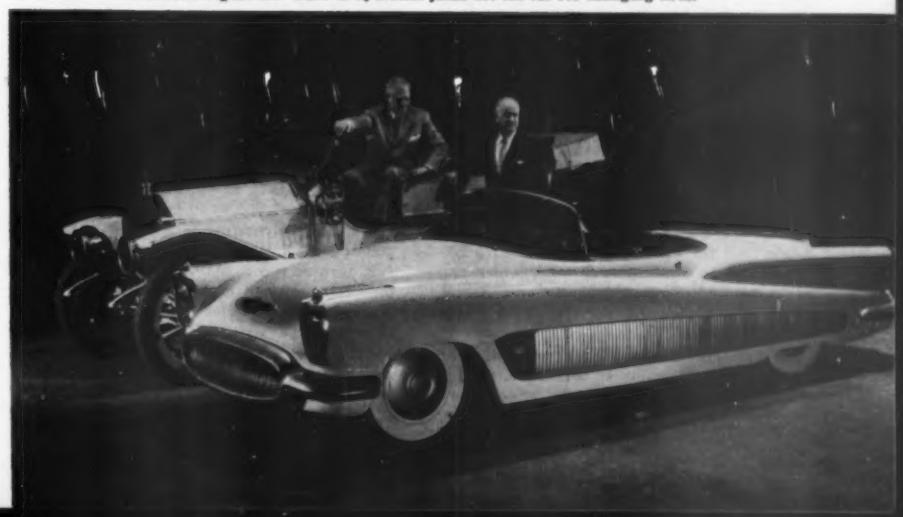
Following are comparative records of a number of cars entered both years:

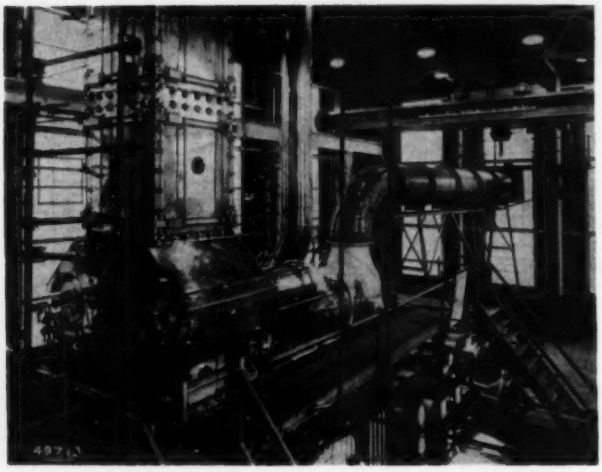
Car	1951 Mileage	1950 Mileage
Cadillac Series "61"	21.719	22.972
Chevrolet Styleline	22.041	21.071
Chrysler Windsor	20.886	19.853
DeSoto	19.921	18.778
Ford Six	25.915	23.326
Hudson Commodore	19.590	21.386
Lincoln	25.448	18.150
Mercury	25.945	26.524
Nash Statesman	26.122	25.522
Packard 200	22.023	18.920
Plymouth	22.990	21.254
Studebaker Commander	28.001	23.794
Willys Four	26.769	25.612*

*Average of three cars

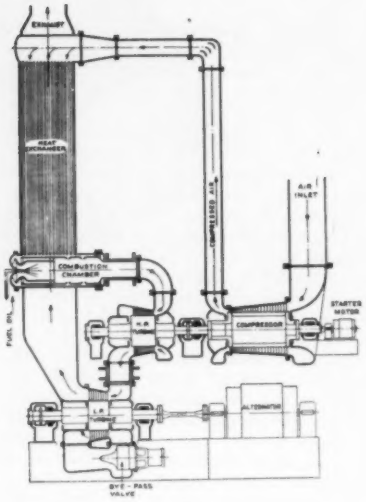
One of 21 distinctive body styles for 1951 announced by the Chrysler Corp.

A 1910 model Buick towers over the experimental XP-300 which stands only 39.1 inches high at the cowl. This car is powered with a 300 hp supercharged V-8 engine. It has duel fuel tanks, one for alcohol and one for gasoline. Built-in hydraulic jacks lift the car for changing tires.





Gas-turbine-alternator set on test at Rugby.



Diagrammatic layout of gas turbine set.

Gas Turbine For Shell Tanker

THE first gas-turbine engine in the world, working on heavy fuel oil, to be installed on a vessel of the mercantile marine, has completed its land trials at Rugby, England, and is being installed for service trials in the motorship Auris of the Anglo-Saxon Petroleum Co. Ltd. It represents an epoch making advance in this type of propulsion, embodying to a certain extent the principles of the jet engine, with which however it is not to be confused.

The principle of operation is easily followed by reference to the accompanying diagram.

Air is drawn from the atmosphere, without prior filtration or treatment, through a silencer to the compressor, where it is compressed to about 60 psi; the compressed air then passes through the tubes of the heat exchanger, round which pass the exhaust gases of the L.P. turbine. In this heat exchanger the temperature of the air is raised to about 260° C. Leaving the heat exchanger, it is divided into two parts, one for the primary combustion in the combustion chamber, the residue being used as secondary air in the combustion.

The products of combustion pass to the H.P. turbine at a temperature of about 585° C. This turbine is of sufficient size to drive the air compressor supplying the air for combustion, and that is its sole duty.

The outlet gases from the H.P. turbine then pass to the L.P. turbine which is the actual power unit for driving the alternator; a by-pass valve at this point, through which the gases can be exhausted to atmosphere, serves as a control during the operations of starting-up and shutting-down.

The testing of the set for soundness of mechanical construction, to obtain preliminary performance figures and to carry out any necessary adjustments was made on gas oil. During this period, the set was operated for 193 hours. Since that time it has been operating for nearly 350 hours on heavy fuel having a viscosity of 1500 secs., Redwood No. 1, at 100° F., without any previous filtration or clarification.

The burners used were specially designed for the purpose by British Thomson-Houston and Shell engineers conjointly, with a view to getting smoke free combustion, and at the time of the visit no evidence of smoke could be observed at the gas outlet of the plant.

With regard to the performance of the set, as shown by the table, it should be realized that it is running "as designed," no changes in design having been made. Certain modifications shown to be desirable undoubtedly will raise the thermal efficiency.

For starting, the 50 H.P. motor shown in the sketch is provided. The set is started up with the L.P. by-pass valve open and run up to a light-up speed of 1500 RPM (20 percent of full speed). At this speed, the burners are opened, and the set accelerated by the gas-turbine, with diminishing assistance from the starting motor. The latter's torque falls to zero, at a HP shaft speed of 1800 RPM, whereupon the motor is automatically disconnected.

During the starting cycle, a peak turbine-inlet temperature of 480-540° C. is reached, but as the set accelerates toward the idling speed, this temperature falls gradually to 330-400° C., dependent on ambient conditions and L.P. turbine speed. At "idling" the H.P. turbine runs at about half speed, i.e. 3000 RPM.

Having run its trials, at the works of the builders, The British-Thomson-Houston Co. Ltd., the set was dismantled preparatory to installation in the Anglo-Saxon Co's D.E.S. "Auris" for service trials.

This tanker was built especially with provision for installing an experimental gas-turbine set. Her present machinery comprises four diesel engine-driven alternators which supply current for a main motor driving the propeller. One of the diesel sets will be removed, and replaced by the gas-turbine unit. The space available is sufficient for the installation of a gas-turbine of adequate size for the purpose, the ship having been built with this in view.

Until the reliability of the gas-turbine under sea-going conditions has been proved, adequate alternative power must be available should it be necessary to shut down the gas-turbine set at sea. This is provided for in the three diesel sets which are retained.

GAS-TURBINE PERFORMANCE TESTS

	25 Jan. 51 Max. Load HEAVY OIL Test Readings
Compressor inlet:—	
temp. (°F)	39
pressure lb/sq.in. abs	14.17
Compressor outlet:—	
temp. (°F)	332
pressure lb/sq.in. abs	60.03
Combustion chamber inlet:—	
temp. (°F)	500
pressure lb/sq.in. abs	59.41
*H.P. turbine inlet:—	
temp. (°F) reading	1085
calculated	1092
pressure lb/sq.in. abs	57.83
L.P. turbine inlet:—	
temp. (°F)	820
pressure lb/sq.in. abs	23.50
Isentropic efficiency %:—	
Compressor	86.3
H.P. turbine	84.3
L.P. turbine	89.5
Heat exchanger:—	
gas inlet temp. (°F)	682
gas outlet temp. (°F)	496
pressure drop lb/sq.in.	0.26
H.P. turbine speed rpm	6000
L.P. turbine speed rpm	2940
Compression ratio	4.24
Air mass flow lb/sec.	28.8
Fuel consumption lb/h.	925
Output at Alternator terminals (corrected kw)	1022
Fuel rate lb/kwh	0.905
Overall thermal eff. %	21.4

*It is difficult to measure accurately the temperatures at H.P. turbine inlet. This entry therefore sets out calculated values derived from the L.P. turbine-inlet temperatures that are reliably recorded.

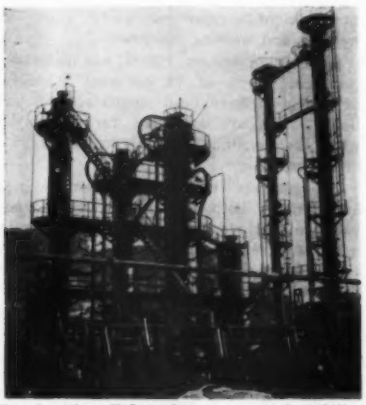
Thermal Cracking Unit On Stream At Wakayama

A NEW 3,500 barrel-per-day thermal cracking unit has gone on stream at the Wakayama refinery near Osaka, Japan, marking a further step in placing the Japanese petroleum industry on a self-supporting basis. Built largely out of pre-war equipment assembled at the bomb-damaged refinery the addition of the new cracking plant is part of a long-range reconstruction program undertaken by Toa Nenryo Kogyo, subsidiary of Standard-Vacuum Oil Co., at Wakayama and Shimizu refineries. Standard-Vacuum entered the Japanese refining picture for the first time in 1949 when it acquired a majority interest in Toa Nenryo. Prior to World War II, Stanvac had been a marketer in Japan for more than 50 years.

The Wakayama and Shimizu plants are expected to increase their production rates and add new facilities in keeping with the growing civilian demand for oil products in that country. Japanese consumption, still rationed, has climbed from about 30,000 to approximately 40,000 barrels per day since the oil companies were permitted to resume competitive marketing operations in April, 1949. Pre-war civilian demand in Japan was on the order of 80,000 barrels per day.

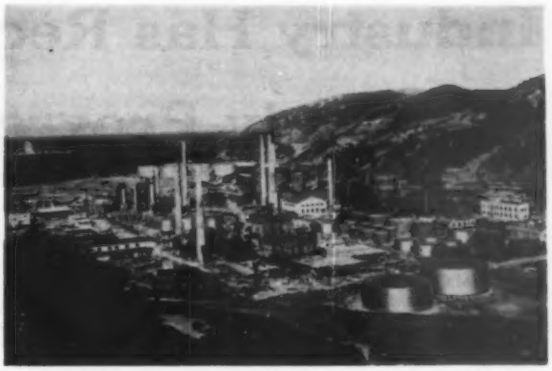
About 90 percent of Japan's oil has to be imported either as crude oil or as finished products. For a considerable post-war period products were imported by the occupation authorities with funds appropriated by the U. S. government, but beginning last October the importation of crude was authorized on a commercial basis, thereby increasing the supply of locally manufactured oil products and decreasing product imports.

Post-war operations began at Wakayama in April, 1950. Since then an ingenious re-



Fractionating, light-ends recovery and stabilization towers of the new 3,500 barrel-per-day thermal cracking unit which has just gone on stream at Wakayama refinery in Japan.

construction program has utilized war-damaged towers, heat exchangers, pumps and oil lines to give the plant a two-stage atmospheric pipe still and wax-pressing facilities for the production of lubricants. The present crude charging rate of 5,500 barrels per day is based upon current crude allocations, although the refinery is capable of charging



Wakayama refinery near Osaka shows signs of progress under the rehabilitation program carried out since 1949, here and at the Shimizu refinery, by Toa Nenryo Kogyo, with technical and financial aid furnished by Standard-Vacuum Oil Co. Center foreground shows initial construction on new 3,500 barrel-per-day thermal cracking unit which has just gone on stream. Deep-sea tanker facilities, behind hill at right, are reached by pipe line through a tunnel in the hill.

10,000 barrels per day. In addition to the new thermal cracking unit now on stream, de-asphalting and phenol extraction facilities are planned for completion later this year to up-grade lubricant quality. Other facilities to raise lubricant production eventually to about 900 barrels per day are now in the planning stage.

Shimizu, originally a lubricating oil refinery, also has been revamped to increase its charging rate and to diversify its product range. Operations began in February, 1950, and the Shimizu plant jumped quickly from 1,200 to 4,000 barrels per day and currently is charging 5,000 on allocations. New equipment includes a 350 barrel-per-day solvent de-waxing unit.

These two plants, which together employ some 1,300 workers, thus are supplying approximately one-fourth of the petroleum products now being consumed by the Japanese people.

Pan-American Southern Expands Destrehan Plant

PAN-AMERICAN Southern Corp. has announced the award of a contract to The Lummus Company for the construction of units to produce aviation gasoline and jet fuels at its Destrehan, Louisiana, plant. This is part of a $6.5-million program adopted for this refinery which will greatly enlarge its facilities and enable it to supply specialized fuels required by the national defense campaign.

Destrehan refinery is located 18 miles north of New Orleans, on the Mississippi River, and has a crude distillation capacity of 8,000 barrels daily. Its operations have been limited to asphalt production, lube blending, grease manufacturing and terminal activities. It occupies a site of 1,100 acres with dock facilities both for river craft and ocean tankers and storage capacity for 3,000,000 barrels. The additions now to be made will turn out 7,500 barrels daily of grade 100/130 aviation gasoline or 4,000 barrels grade 115/145 plus 200 barrels grade 100/130. Jet fuel production will be about 5,000 barrels daily. The revamped crude unit will permit simultaneous processing of 15,000 barrels daily of light coastal crude to a low percentage of fuel oil bottoms and 5,000 barrels of heavy asphalt crude to asphalt bottoms.

The fluid catalytic cracking unit, a No. 4 type of Standard Development design, will process 12,000 barrels daily of gas oil at high conversion and will operate in blocked operation with a retreating cycle. The vapor recovery unit will recover light ends from the fluid catalytic cracker. Products from the vapor recovery unit will consist of PP-BB charge and the unit is so designed that the recovery of propylene can be varied from 60-vol percent to practically zero-vol percent. The alkylation unit will have a capacity of 2,500 barrels daily using sulfuric acid as catalyst. Flexibility will be provided to allow for alkylation of mixed propylene butylene or butylenes alone.

A steam generating plant, additional tankage and other associated auxiliaries will form part of the new construction.

The new facilities have been approved by the Petroleum Administration for Defense and the project is covered by a federal certificate of necessity. Construction is to begin immediately and it is expected that the plant will be ready to go on stream by midsummer 1952.

Pan-American Southern recently completed a program of expansion at its El Dorado, Arkansas, refinery, including the installation of a large coking unit and a new catalytic cracking unit. The Destrehan project is a second step in the company's construction program within the past eighteen months.

R. T. Colquette, vice president of the company in charge of manufacturing, has announced the appointment of Dr. J. W. Bertetti as assistant general manager in charge of manufacturing to handle the construction program at Destrehan. Dr. Bertetti previously has been manager of the company's El Dorado refinery.

British Equipment Industry Has Record Of Steady Progress

WHILE there has been a very great expansion since the close of the late war in the production and export by manufacturers of the United Kingdom of oil industry equipment it is impossible to measure this growth exactly by published statistics. To begin with the figures compiled by Oil Companies Material Secretariat pertain only to orders placed by British companies for overseas use whereas it is well known that much of the increase in the past few years has resulted from purchases by foreign companies. British tools and machinery, formerly seldom seen in oil fields or refinery operations, are now well and favorably established in the petroleum industries of both hemispheres.

Not only are the reports issued on exports of equipment confined to only a portion of the actual sales area, but they by no means cover the whole range of products purchased by oil operators as essential or accessory to their activities. Such things as various forms and shapes of steel, roadmaking machinery and building material, ships, dock and terminal fittings and many other appurtenances that enter into every large scale petroleum development form a large unreported part of exports.

As an instance of this, figures have been published giving the state of the order books of British Shipbuilding Companies as at the end of September 1950. These show 575 vessels on order with a total tonnage of 3,312,000 million tons of which 1,974,000 tons is tanker tonnage. This tonnage is further divided into 2,150,000 tons for British customers and 1,-162,000 tons for foreign customers, the total values of the orders being £180,000,000 for British customers and £85,000,000 for foreign customers.

From these figures a reasonable assumption can be made that at the date mentioned shipbuilders had orders on their books to the extent of about £50 million for foreign tankers. Incidentally, since the date given very large orders for tanker tonnage have been placed with British builders by foreign oil companies. None of this figures among petroleum equipment although it is obvious that it forms a large constituent in the trade arising from petroleum operations.

While available statistics, therefore, do not give a comprehensive picture of petroleum equipment exports they do serve within the limits stated to exemplify the rate of progress during the five years following the war. These figures are as follows:

Year	Pounds Sterling
1945	14,314,356
1946	33,537,504
1947	46,777,578
1948	61,077,135
1949	63,836,431

The year 1945 cannot be considered in any way representative since the war was still in progress during its early months. In the four succeeding years however these classified shipments were practically doubled, a most encouraging rate of progress.

In 1950 new factors affected the statistical showing. The devaluation of the pound was reflected in a lowered monetary value while the volume of products was not reduced to a similar degree. At the beginning of the third quarter of the year a shift was made in the basis of reports from the period of delivery to the period of ordering. Allowing for the change in value of the monetary unit the reported export value of £44,200,000 represented a small increase over the preceding year.

A factor that probably operated to diminish overseas shipments during 1950 so far as refining equipment is concerned was the great increase in refinery construction within the United Kingdom. In 1951 the growing absorption of plant facilities by requirements of the armament program has further affected this situation. In numerous instances manufacturers have had to decline proffered orders because their plants were booked to capacity for long periods ahead or because of uncertainty as to the availability of essential materials.

Despite these determents and a certain amount of uncertainty arising from the decision of the government to proceed with the nationalization of steel real progress is to be noted in the development of the petroleum equipment industry. This is observable in a broadening of markets. Within the past several months structural steel, line pipe and tubular goods have entered into the fulfillment of construction contracts in the United States, Canada, South America and the Middle East. Britain has resumed a long lead over other countries in the building of tankers and other shipping needed by oil companies in their international operations. As British equipment in other lines of oil industry activity has become better known and has demonstrated its high quality demand for such products has increased.

Much credit for the sound progress of the equipment industry belongs to the Council of British Manufacturers of Petroleum Equipment which was formed in 1943 by a small group of companies and has grown steadily in numbers and usefulness since that time. The Council has been active in surveying the requirements of overseas markets, in encouraging research for the improvement of equipment and in impressing upon individual manufacturers the importance of making their names and services known throughout the oil world by means of established channels of publicity and by dispatching their representatives on sales and study trips to various countries.

One line of endeavor in which the Council has provided useful leadership is in the promotion of standardization. The difficulties of standardization in such an industry as that of petroleum are great, when the multiplicity of its requirements is realized, ranging as they do from a test-tube to a 30,000 ton or more tanker, from an aspirin to thousands of tons of heavy chemicals and catalysts, from a one pint oil-can to a 120,000 barrel tank, from a ⅛ inch pipe to thousands of miles of 30-35 inch oil tubing, from a tiny drill for instrument work to mechanisms capable of drilling five miles or more below the earth's surface. So diverse are the oil industry's requirements that it would be difficult to specify any manufacturing industry whose products are not either directly or indirectly affected by them.

Certain products are, however, more specific to the industry, and form the major parts of its requirements; and it is in this direction that standardization can be most successfully employed in developing uniform systems of measuring volume, length, specific gravity, temperature and so forth.

The Council (CBMPE) has been keenly aware of the advantages of standardization, and on its request the British Standards Institution (BSI) authorized the formation of the Petroleum Equipment Industry Standards Committee (PEISC) to study the standardization of petroleum equipment for manufacture in the United Kingdom. Representatives of the oil industry have been appointed to serve on the following committees of the BSI: chemical engineering; instruments for industrial purposes; iron and steel; mechanical engineering; non-ferrous metals; packaging (tins, cans and drums, corrosion preventing and wrapping, and packaging materials and equipment); refractories and thermal insulation; scientific and laboratory glassware; welding and welding equipment.

Since its formation, PEISC has undertaken the preparation of 73 different standards, of which 11 have been completed and published, nine are approved for publication, while the remainder are in various stages of development.

The subjects treated range through pipes and fittings, both ferrous and non-ferrous; valves of various kinds; bolting and jointing materials; refractories, heat exchangers and tubes; packaging materials, storage tanks and fittings; welding; temperature measurement and electrical equipment; non-sparking tools; gas masks and respirators, and various other categories.

In all cases an endeavor has been to draft specifications in such a manner that they are interchangeable with established American Petroleum Institute specifications, which have been generally adopted. The advantage both to buyer and seller of knowing that goods brought to specification in one country can be directly fitted to equipment brought in another is obvious. At this stage many British manufacturers are willing to quote for various types of equipment made to API standards and to fabricate same, under license if necessary, in British workships, for export or home use.

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1942... Cyanamid starts production of synthetic fluid cracking catalysts at Ft. Worth to help refiners meet the demand for high octane fuel.

1946... Cyanamid expands Ft. Worth plant.

1946... Cyanamid becomes the *first* company to manufacture microspheroidal cracking catalysts on a commercial scale.

1948... Cyanamid expands production of MS catalyst at Ft. Worth in anticipation of growing demands.

1951... Cyanamid builds new MS plant at Michigan City, Indiana, as refining demands continue to grow.

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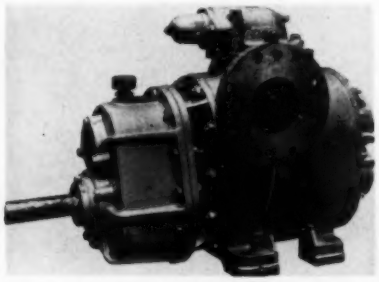
In sum it may be said that the petroleum equipment industry in the United Kingdom has reached a point of stability, that it has greatly improved its products over the past decade, that it is now in a good competitive position and that its activities appear destined to future growth commensurate with the growth of the petroleum industry itself.

Positive Displacement Tanker Pump

Stothert & Pitt, Ltd., Bath, have developed a self-priming positive displacement pump for mounting on tankers for handling aviation spirit and similar fluids. A feature of the pump is its small size and light weight for the normal capacity of 200 gallons per minute against pressures up to 50 pounds psi.

The design follows the principle by which an all round clearance is maintained around the



pumping elements which can never be in metallic contact with each other or with the pump body. Therefore, the non-lubricating properties of the fluid cannot cause wear inside the pump. The shafts are supported externally to the pump and mechanical seals are fitted in place of the usual gland packing.

An increasing gear is included in the timing gear case, having a suitable gear ratio to suit the speed of the power take-off, which can be as low as 700 rpm. For those cases where the power take-off can run at screw shaft speeds of approximately 1600 rpm the drive is taken direct on the screw shaft and the overall length is less.

Equalizing Hoisting Equipment

Felco Hoists, Ltd., of London, have recently introduced an equalizing sling of interest to the petroleum industry where heavy objects of awkward shapes have to be lifted. The legs of this sling automatically adjust themselves so as to keep the load exactly balanced, or at any desired angle, thus avoiding the necessity of using special slings of odd lengths.

Oil Field Ambulance

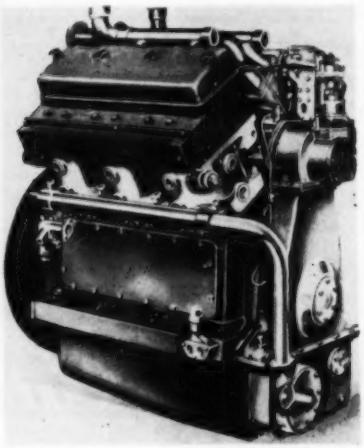
For use in oil fields of the Lake Maracaibo area, Shell Petroleum Co., Ltd., has adopted the ambulance shown in the accompanying photo. This equipment, built by Rootes, Ltd. (bodywork by G. H. Sparshatts & Sons, Ltd., Southampton) was designed for use in Venezuela. It is all metal, with insulated roof and has an engine of 100 hp. The picture shows a wheeled, rubber-tired stretcher being loaded in the ambulance, and seats for sitting patients. Other equipment includes wash basin, first aid kit, electric fans and a searchlight. Cost about £1500.

Spraying Metals from a Powder Pistol

Application of metal sprays is increasingly applied to oil storage tanks, tanker hulls, oil barges, road tankers, pipe lines. The Schori model 50 powder pistol (Schori Metallising Process Ltd., London) has been developed to meet these needs. With it zinc may be applied at the rate of 400 sq. ft. per hour to a thickness of .002 inches with a normal efficiency of 75 percent or with a final efficiency of 90 percent if the undeposited powder is collected. In the case of aluminum 250 sq. ft. may be sprayed per hour to a thickness of .002 inches with a normal efficiency of 85 percent, or a final efficiency of 95 percent, assuming that the undeposited powder is reclaimed. Any other metal which can be obtained in powdered form may be applied to any desired thickness with this pistol. Two factors combine to produce such remarkable results, one being the pressure feeding of the powder and the other the conveying of the powder in a non-oxidizing medium.

Oil Well Drilling Sets

Davey, Paxman and Co., Colchester, are now producing well drilling sets which incorporate the "package" principle in sizes ranging from 90 to 665 continuous available brake horsepower. The set giving the largest output is their Mark 16RPH 16-cylinder turbo-charge engine.



A development of interest to oilfield engineers is the 200 hp 6-Vee RPH, a compact unit with the same output as the in-line model but a reduction in length of two feet through being arranged in Vee form. Turbo-charged applications are also available with a corresponding power increase of 25 percent.

Sheet Aluminum and Rock Wool Insulation

William Kenyon & Sons, Ltd., of Dukinfield specialize in heat insulation finished with sheet aluminum. The advantages of sheet aluminum are its appearance, light weight and low maintenance cost, as frequent painting is unnecessary. It is used, for instance, in the thermal insulation of distilling columns with a rock wool insulation of low thermal conductivity and the low density of 0.6-lb. per cubic foot. The insulation is sheathed in a sheet metal finish so that sheet and insulation can be removed together. All joints are labyrinth to insure water tightness and fitted to accommodate thermal expansion. Another specialty is a vermiculite fire proofing concrete specially designed for the petroleum industry.

Compressors

Featured at this year's British Industries Fair was a line of feed pumps, air pumps, chemical injection pumps and oil pumps produced by G. & J. Weir, Ltd., Cathcart, Glasgow. This firm also produces evaporating and distilling plants, regenerative condensers, closed feed systems, and other specialties.

New Stacking Truck

Industrial Truck Development, Ltd., are offering new developments in mechanical handling equipment, with particular emphasis on a new battery operated "Stacatruc" fork-lift truck of one to one and one-half ton capacity. Considerable attention has been given to accessibility of the component parts. The photo shows the battery being removed sidewise. Sufficient battery-power is provided for eight to ten hours of working time under normal conditions.

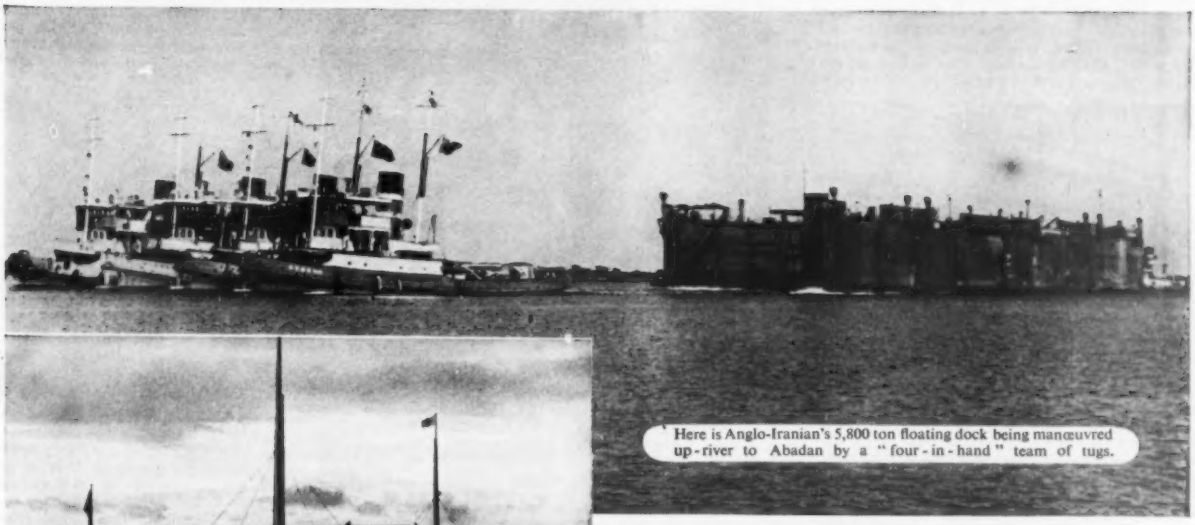
Harvey's BIF Exhibit

The varied contributions of G. A. Harvey Ltd. (London) to export business were illustrated in their exhibit at the British Industries Fair. They supply pressure vessels, autoclaves, fractionating and absorption towers in steel plate up to 3 inches in thickness and of any diameter and length, to Lloyds Class I rules, insurance companies and API-ASME codes; "Rotarprest" heads five to 15 feet in diameter and up to four inches thick, diepressed dished and flanged ends six inches to nine feet diameter, channel, angle and flat bar rings. Their plant is able to roll bars cold up to 16 inches by six inches joist and 12 inches by one inch flat, to mention only two of the heavy sections. A notable exhibit is the "Harco Tapergil" gilled tubes displayed in varied diameters and pitch of gills. This product is considered greatly superior to the ordinary gill wound on the tube cold. This new type of gill has no crimp; it is twice as thick at the bottom as at the outside edge, the cross section of the strip being tapered.

Safety Tools for the Petroleum Industry

The Telegraph Construction & Maintenance Co. Ltd., Greenwich, which has been producing telcon bronze (Beryllium Copper) safety tools since 1940 now supplies standard tool kits of this material for the petroleum industry. These are in use on many tankers and at shore installations. One of these kits is shown in the accompanying photograph and any range of the 400 tools available can be made up into a kit on request.

Ships of the Line



Here is Anglo-Iranian's 5,800 ton floating dock being manœuvred up-river to Abadan by a "four-in-hand" team of tugs.

A vast variety of vessels is afloat in the service of Anglo-Iranian, besides the huge tanker fleet to which the ship on the left now belongs. This is the "British Adventure," launched in December, 1950 — of 28,100 tons — the largest tanker so far built in Britain. Even bigger vessels are now on order for Anglo-Iranian's fleet.

Launches for refuelling flying boats.

Fire Drill on board one of Anglo-Iranian's fire floats.

First and Biggest

oil producers in the Middle East since 1912, Anglo-Iranian Oil Company and its associated companies also operate twelve refineries in Europe, Middle East and Australia: their sales organisation includes major marketing or supply interests in Europe, Asia, Africa and Australasia, with international ships' bunkering and aviation services.

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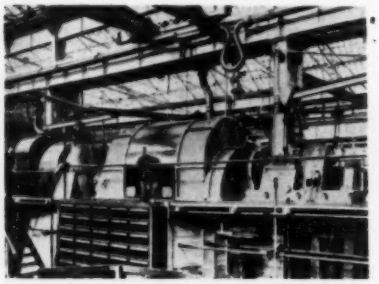
Parsons Turbo-Alternator for Venezuela

The illustration herewith shows a new British-built 10,000 KW turbo-alternator, completed six months ahead of schedule by C. A. Parsons and Co., Newcastle-on-Tyne; it is the first of this type to be built for Shell to be used on the eastern shore of Lake Maracaibo. The turbine is designed for steam pressure of 275 psi, steam tem-



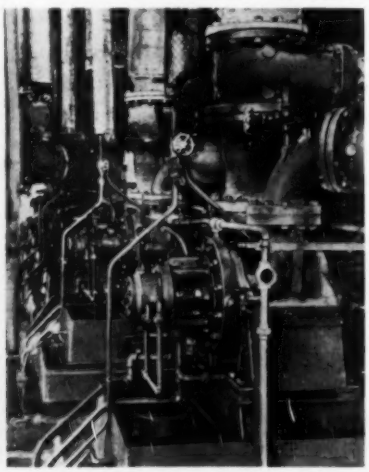
perature of 564° F., superheat 154.6° F. with steam consumption at 100 percent rate 12.35 lbs per KW-hour. The alternator, rated at 10,000 KW CMR, delivers 6,900 volts, three-phase 60 cycles at a power factor of 0.8; speed is 3,600 rpm, efficiency at full load 96 percent; temperature rise of the stator is 80° C., of the rotor 90° C.; maximum air temperature 40° C., exciter voltage 150 V. air cooler with circulating water at 700 gpm and 96° F. The cost of the unit was about £85,000.

Drum and Can Closures

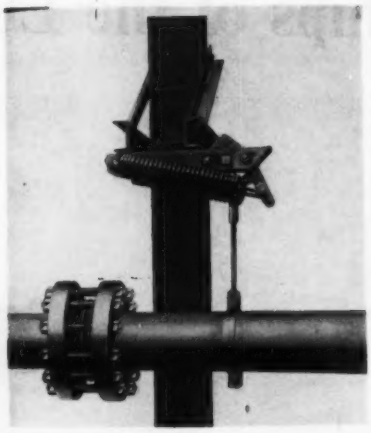
Vise-Grip Products Ltd. of London are now manufacturing vise-grip bung closures that have long been extensively used in the United States.

Sigmund Oil-Refinery Pumps

The photograph herewith shows a group of hot oil pumps made by Sigmund Pumps Ltd., of London, for the second distillation unit in the Shell refinery at Cardon, Venezuela. These units bring the total pumping power applied to oil by Sigmund Pumps at this refinery up to 20,000 h.p., the largest installation of its type yet equipped



with British-designed process pumps. The unit in which this group of hot oil pumps is installed has a crude oil intake of about 140,000 barrels per day. In its long career Sigmund Pumps has developed all types of pumps employed in oil refining, using special alloys where necessary, and going up to very high pressures and temperatures up to 950° F. in catalytic cracking installations. Some of their hot oil pumps are turbine-driven at 4,000 rpm in a high vacuum; at the opposite extreme are pumps for sub-zero duties (—32° C.) in dewaxing.



Constant Support Pipe Hanger

This item of constructional equipment has been recently introduced by Vokes, Ltd., Henley Park, Guildford, to the industrial market for supporting pipe lines subjected to high temperatures. This makes it of interest to the oil industry as an accessory in refinery construction.

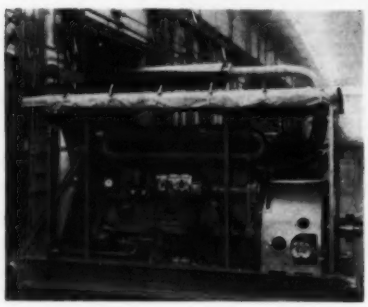
Vokes genspring is a light, compact spring mechanism which provides a constant effort for supporting pipe lines with a wide range of vertical movement. Its compensating spring system of tension load-accommodation eliminates dangers arising from unequal stresses usually associated with the variable supporting effort of ordinary spring hangers. It therefore avoids piping joint and flange failures and all similar troubles. It is the British equivalent of the well-known Grinnel constant support hanger, which is widely used in American industry, particularly in oil refining plants.

Automatic Drum Loader and Stacker

Kenton Equipment Ltd., London, long-time makers of drum and barrel handling equipment, have recently designed and built to the order of Shell Mex and British Petroleum Ltd. a novelty in this line by which warehouse personnel can make short work of loading oil drums onto trucks or stacking them. All that is necessary is for a man to roll the drum upon a platform three inches high and step on a pedal. The apparatus automatically raises the drum within five seconds to the right level, from which it rolls away to where it is wanted. Two operators can handle filled drums at the rate of one ton a minute.

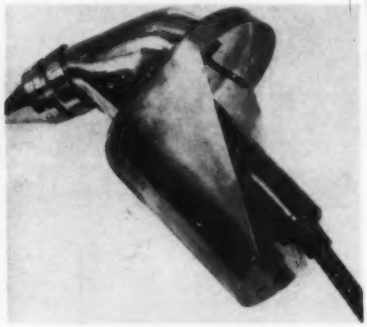
Engine Package for Drilling Rigs

English Electric Co. Ltd., of Rugby, supply a 220 HP Diesel engine of the "package" type for a drilling rig unit. Its weight is 12,390 lbs., its output 200 BHP-hour. It has all the high class fittings necessary to a durable Diesel engine for the types of work for which it is designed, and can generate power for rail traction, or marine duties (see photo). It is also available for use as a gas engine.



Welding Electrodes

At the British Industries Fair, 1951, Rockweld Ltd., Croydon, have exhibited a number of new items in electrodes and accessories which embrace practically every application in welding. There are six new electrodes for welding the various stainless and heat resistant steels, one in particular for members requiring strength at 800° C. and for joining stainless steel to carbon steel.



Oxyarc gun holder

There are two new types of mild steel electrodes particularly suitable for overhead welding and eminently suitable for pressure vessel work; also two new types of lime-ferritic hydrogen controlled electrodes for highly constrained conditions for welding low-alloy high-tensile steels, high sulphur steels and for strength welds in cast iron. The firm has made substantial advance with the oxyarc cutting process for use on large-diameter thick-wall cast pipe. They have also developed a wider range of oil-cooled welding transformers from 18 to 400 amperes in numerous steps, suitable for a great variety of purposes.

Flameproof Contactor Panels

For greater safety in various processes of oil refining in connection with the use of numerous small electric motors of ½ to 60 hp, A. Reyrolle & Co., Hebburn (Dur.), have developed flameproof air-break starting contactor panels for use in medium-voltage systems up to 550 volts.

Each contactor chamber contains the three-pole electrically operated contactor with push buttons, and, in addition, main circuit fuses, control circuit fuses, over-current and earth-leakage protective devices. The isolators are interlocked with their contactors and the contactors comply with the requirements of B.S. 775, being suitable for making and breaking 480 amperes. The complete interiors in the contactor compartments are completely removable and interchangeable.

Fibreglass for Pipe Wrapping

Fibreglass, Ltd., of St. Helens, Lancs., are marketing a new grade of high strength tissue which will stand hot bitumen and can be applied at high wrapping speeds and tension to large pipe lines. This wrapping got its first large-scale use in the Middle East. The entire length of the Iraq Petroleum Company's Kirkuk-Banias 30-inch line was wrapped with it and it has been used by Shell on butane lines in Venezuela. High strength tissue 0.02-inch thick and three inches wide has a tensile strength of 40 pounds and can withstand loading in molten bitu-

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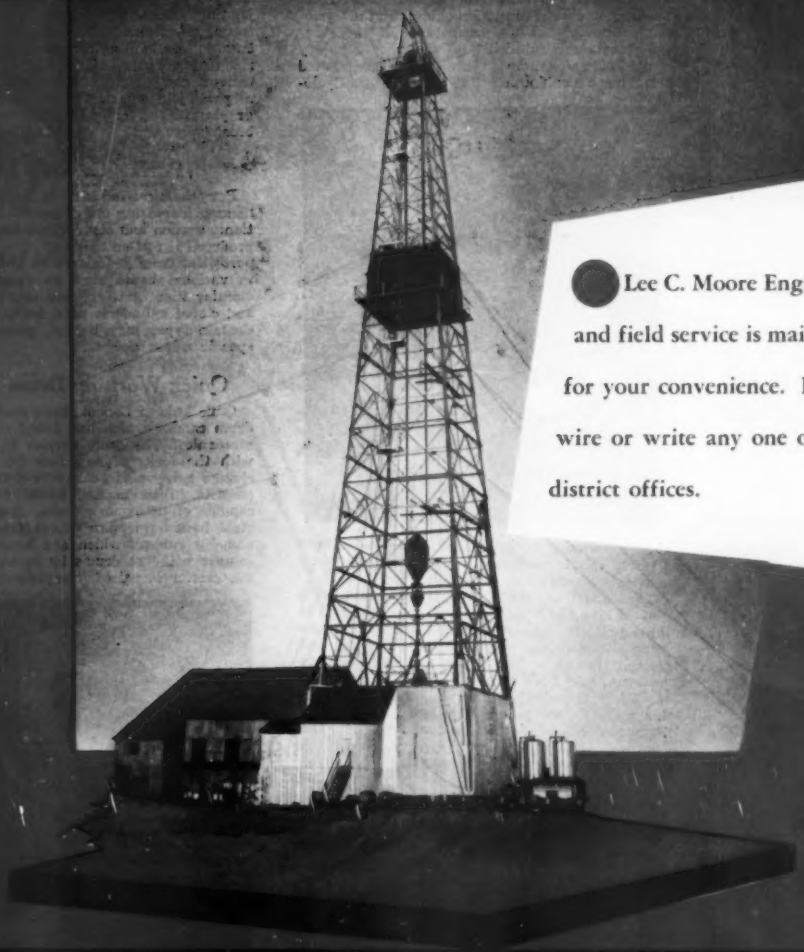

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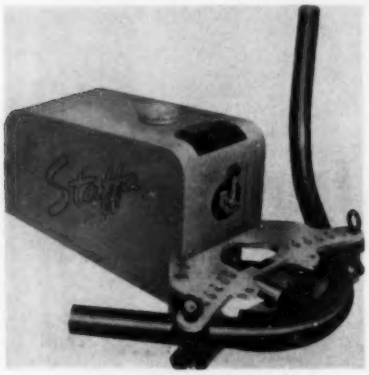
men at 550° F. without appreciable loss of strength. A lighter grade, called "standard staple tissue," is produced for mill-wrapping of service pipes. The photo shows a machine applying high strength fibreglass tissue in the Middle East.



New Pipe Bending Machine

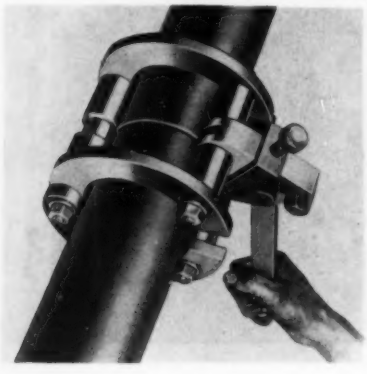
Chamberlain Industries, Ltd., are putting out a new type of pipe bending apparatus which is a self-contained unit that requires no hydraulic accumulator or air line, as the pump is mounted on its own reservoir of specially selected hydraulic oil. The design takes up minimum floor space and allows the operator to walk around it without hindrance from extraneous fittings. The power unit is totally enclosed. It has an eight-ton, ten-inch stroke, double action ram. Take-off arms are provided which on the return stroke automatically eject the pipe. The photo represents a two-inch machine and has a one-half horsepower motor for 220-230 volts, single phase 50 cycles.

Specialized Tank Cars for Oil Products

There are important differences in the natures of oil products that call for more or less specialized types of tank cars for rail shipments. Volatile products may require room for expansion which has to be taken care of in the construction of the dome, or by provision of insulation against the hot sunshine of tropical or subtropical regions. On the other hand viscous oils require heating arrangements to facilitate discharge at destination. In between are oils that are more or less indifferent to climatic factors. Hurst, Nelson & Co. Ltd., Motherwell, are building three principal types having special features adapted to the three classes of products.

Holding and Aligning Pipes for Welding

Speedy and accurate setting up of one pipe to another for butt welding presents a problem that has been solved by the special twinner pipe



clamps designed and produced by Donald Ross & Partners, Ltd., London.

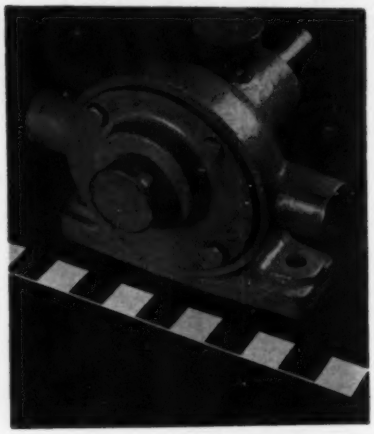
A split ring type of clamp is placed round the pipes to be welded and is positively locked by a toggle-actuated claw. The pipes are automatically aligned from the outside, allowing the operator to adjust the distance between them to suit the weld filler. The clamps are made in standard pipe sizes from two inches to twelve inches, with adjustment ⅛ inch larger or smaller than the specified diameter; non-standard sizes are made to meet special requirements.

Plastic Heat-Resisting Seals

Flexibox Ltd., Manchester, are equipping their Flexibox type RR seal with the plastic heat-resisting material "Silastic" for handling liquids at temperatures up to 250° C. in heat-exchanging processes according to the Dowtherm system

Cycloplunge Pump

For a number of years Beck Engineering Co., Bridlington, have been striving to obtain the best possible performance from the smallest possible size of pump. Thus its efficiency had to be at least 80%. Further the minimum possible maintenance was called for with freedom from priming, and possibility of choking. In the Cycloplunge pump, now in production, all these requirements are fulfilled. It is neither a rotary nor a plunger pump in the normally accepted term, nor a combination of these two. The Cyclo-



plunge works on a cycloidal arrangement. There are five simple parts in it upon which the wear and tear is negligible.

The model at present produced is 6½"x6"x 6½" in size and weighs 30 pounds. The bore is three-quarters inch square and the stroke two inches. Since the pump is both sucking and ejecting it has a continuous flow without any reservoir. At 1400 rpm, the maximum pressure is well in excess of 300 psi and the delivery at this pressure, 400 gallons per hour. The suction lift is 25 feet and the head is over 400 feet. The maximum delivery to atmospheric pressures is 600 gallons per hour.

Dexion Slotted Angles

A post-war British invention, now marketed by Dexion Ltd., London, in over 34 countries, is already well-tried in the petroleum industry and has been found extremely convenient because of its adjustability. The interplay of the slots on the 3 inch by 1½ inch angle provides all the bolt holes necessary for two or three lengths to be bolted together at a joint. This system of construction offers several advantages: no drilling or elaborate planning is necessary; cutting marks at three inch intervals further simplify the use of Dexion; completely unskilled labor can use it, skilled work such as welding or joinery being avoided.

Dexion structures can carry loads ranging from light stationary to heavy castings without the use of diagonal cross-bracing. They can be built to suit the goods to be carried and subsequently adjusted to any variations in the size of those goods. After dismantling the angle is, of course, ready for the next construction. There is no scrap. The photo shows a wareroom of a large paint factory; note the steps, also made of Dexion.

Joint Sealing Compounds

Kenilworth Manufacturing Co. Ltd., West Drayton, in collaboration with Shell laboratories and the gas industry have developed a new pipe jointing compound, "Plasti-Coll," that is non-setting, heat proof, and is unaffected by propane butane; this jointing compound eliminates the serious danger of leaking joints in liquefied petroleum gas equipment. They also have developed a pipe joint paste which includes air-blown graphite of better quality for "easy-make, easy break" pipe work in oil refineries.

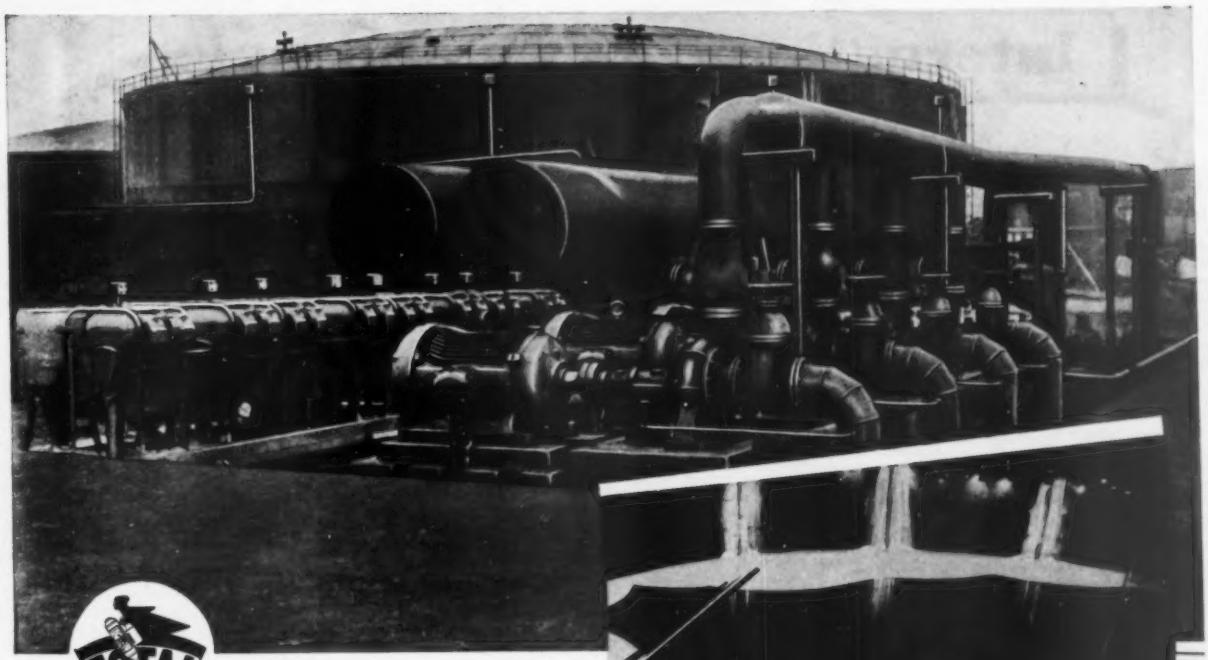
Porous Ceramic Media

Petrochemical industry in its varied aspects is making increasing use of porous bodies for filtration, aeration and other purposes. The materials produced by Doulton and Co., London, have porosities from ½ micron to about 750 microns, in various shapes such as square, rectangular, circular tiles; flat, grooved or ridged tiles, open and closed cylinders; pots, tanks, blacks or rods. Certain types may be cut, ground or sawed to specific measurements.

Quick-Working Drum Handlers

Omic Ltd., of London, have produced a multiple drum carrier which has found use by major oil companies. The drum carrier is interchangeable with the forks of any fork lift truck, the exchange being made easily in a few minutes. It consists, in its standard form, of four cells, each capable of lifting one drum. Each cell contains steel backed gripping shoes faced with special non-slip rubber, which are brought into initial contact with the drums by spring pressure. As the carrier is raised, complete with its load of

(Please turn to Page 92)



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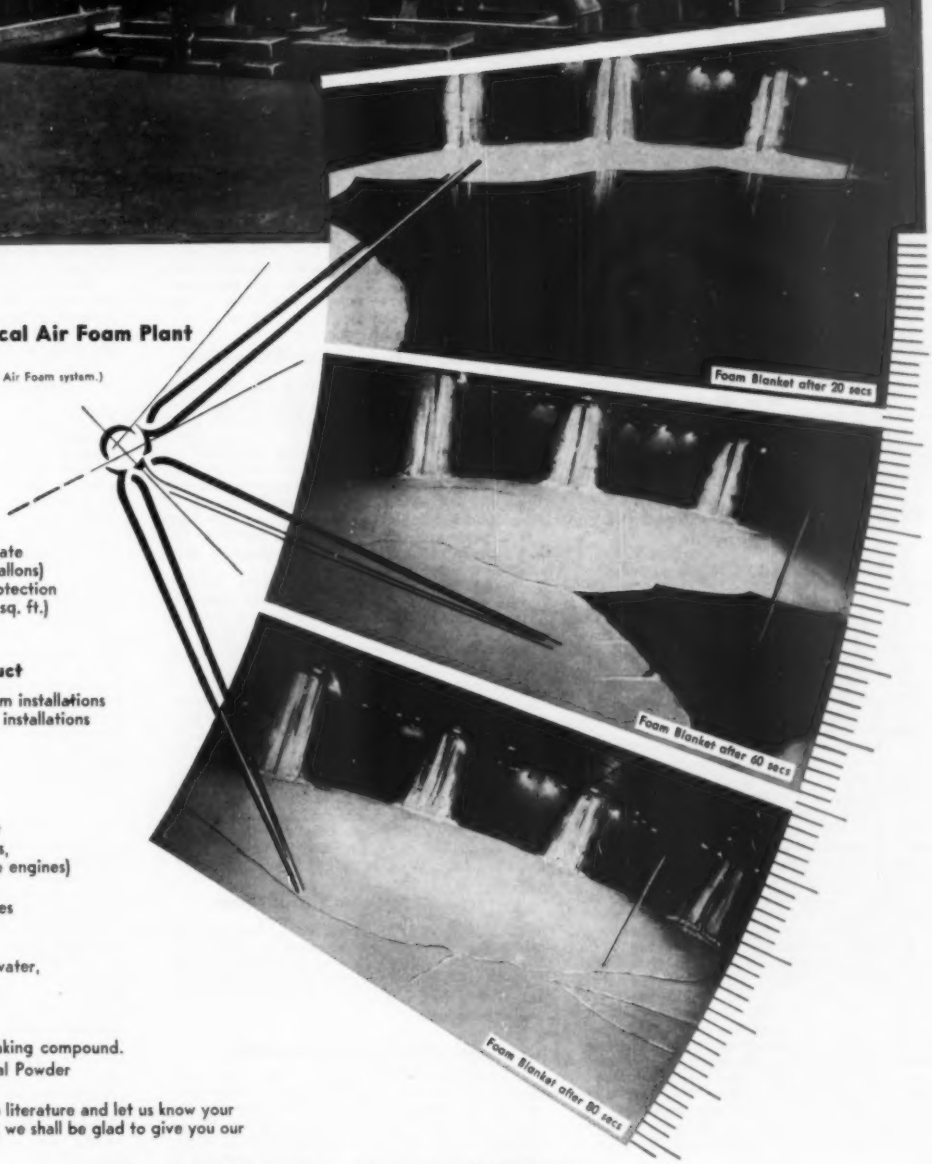

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International news and notes

Vargas Discusses Brazil's Oil Needs

In his first message to the Brazilian Congress Dr. Getulio Vargas, recently elected president, devoted considerable space to Brazil's oil problem. Referring to the 1938 laws which nationalized the refining industry and created the National Petroleum Council he said that they had preserved for the country one of its most valuable resources. Reviewing the rapid growth in the consumption of petroleum products, which reached 4.5 million tons in 1950, an increase of 42 percent over 1948, he said that this indicated the necessity of developing a more adequate domestic industry.

"We must transform the country from an importer of refined products into an importer of crude oil," said the president, "guaranteeing supplies with our own fleet. The final stage will be reached when we cease to consume foreign oil and begin consuming that extracted from our own wells. The government will spare no effort to solve this problem quickly. With this object it will combine official and private initiative, with due regard to the principle that petroleum deposits constitute a national inheritance."

After explaining that Brazil imported petroleum products to the value of $125,000,000 U. S. in 1950, the president added: "The real solution of the problem lies in the abundant production of natural Brazilian petroleum within a brief period. This will call for the full collaboration of all the forces wishing to participate in this gigantic enterprise, whom the government may accept on conditions satisfactory to all."

In a subsequent section of the message the president referred to the need of a larger influx of foreign capital. "It is the intention of my government," he said, "to facilitate investments of private foreign capital, particularly in association with national capital, provided it does not infringe our fundamental political interest."

Broad Developments Ahead for British Columbia

Removal of gasoline price controls in British Columbia, announcements of new refineries and additions to present refining facilities, plus the first major gas well to be found in the Province, reflect the rising tempo of petroleum activity on Canada's west coast.

British American Oil Company, Ltd. has announced plans to build a $10 million refinery on Burrard Inlet at the site of its present tank farm. Capacity of the new plant will be between 10,000 and 12,000 barrels daily.

J. G. Godsoe of Toronto, executive vice president of the company, made the announcement in Vancouver and said the plant would be built within three years. Delivery of oil from Alberta as proposed by companies seeking pipe line rights to the coast would speed construction of the refinery, Mr. Godsoe said.

Second major refinery expansion development in the Vancouver area came when N. Y. Knox, vice president in charge of Pacific Coast operations for Shell Oil of Canada, told of the addition of 60 acres to the company's Shellburn refinery site. Although no definite statement has been made as to the type of refinery addition work has started on a $300,000 warehouse to handle the proposed increase in the plant's capacity. Shell has spent $3,000,000 in plant expansion since the war's end, including a new thermocracking unit and increased topping and storage facilities. Shell also has stepped up its exploration and development activities and now holds interest in several million acres. "We look forward to a substantially increased expansion in the oil industry as a result of the government's action and intend to play our full part," Mr. Knox said.

First major natural gas strike in British Columbia, made in mid-March near Dawson Creek, has spurred the drilling of new wells in that area. Pacific Petroleum, whose Pacific Sunrise No. 3 came in with a flow of 1,450,000 cubic feet per day, has rushed additional drilling rigs to the area.

The Sunrise discovery is the first in three attempts on a 250,000 acre crown permit held 50-50 by Pacific Pete and Peace River Natural Gas. Brought in from the Commotion Creek sands, the gas was produced from depths of 3,086 to 3,126 feet. Deeper formations are being tested.

Two major companies have revealed plans to bid on oil pipe line construction from Alberta to the Pacific Coast. These are Westcoast Transmission, already bidding for the right to build a natural gas line and Trans Mountain Pipeline, which is headed by the Bechtel engineering organization.

Both companies report that they have the funds and steel available for the 715 mile line which it is estimated will take about 150,000 tons of steel and cost in the neighborhood of $86,000,000.

Firms seeking to build pipe lines must first be incorporated by act of Parliament before being able to apply to the board of transport commissioners which considers the proposed route and the financing of the company. Westcoast is already incorporated.

Both companies plan to use all-Canadian routes. Westcoast also plans an additional line down from the Peace River area through Pine Pass to meet its other line at Kamloops.

Brazil To Build More Refineries

Following a conference with President Vargas of Brazil, General Joao Carlos Barreto, president of the National Petroleum Council, told the press that measures were discussed to increase stocks of petroleum products and build additional refineries. Import quotas are to be raised in order to meet the growing needs of industry and provide for any emergency that may arise out of the disturbed international situation. The basis of a project to expand refining facilities also was agreed upon and a definite program is to be submitted to the government.

In addition to plants now built or building General Barreto said contracts with Brazilian capitalists are being examined for the building of two refineries to process 30,000 b/d each. The capacity of the Cubatao plant is to be increased; another for 45,000 barrels is to be erected and a 30,000 b/d refinery will be built in the State of Rio, probably at Niteroy, the capital. Realization of these projects will provide a daily capacity of 160,000 barrels. The installation of special plant for the exploitation of bitumenous schists, to yield 10,000 barrels daily, forms part of the program.

The Brazilian government is said to be optimistic regarding the prospects of American interests collaborating with national capital in the development of the oil industry. Official circles express the hope that the petroleum problem will be satisfactorily solved in the very near future.

Iraq Petroleum Production

Production of crude from the Kirkuk field for the month of February is reported by Iraq Petroleum Co. as 598,704 long tons or roundly 164,640 barrels per day. Output of the Qatar field for the same period is given as 180,513 equivalent to 49,640 barrels daily.

Buys Package Generators

International Petroleum Co., Ltd., has purchased two 30,000 lb/hr "package" steam generators for service in Peru. The units are the largest of their type manufactured by Foster Wheeler Corp. They are equipped to burn either Bunker C or natural gas. Operating pressure is 150 psi.

Venezuelan Output Still Growing

Production of crude oil in Venezuela for the month of February averaged 1,634,961 barrels daily, a record high and approximately 138,000 above the 1950 average. Output for January and February as stated by the Ministry of Mines and Hydrocarbons was as follows:

	1951	
Company	January	February
Creole	751,659	751,502
Shell	504,804	509,723
Mene Grande	224,240	223,008
Socony	46,780	45,171
Texas	25,627	25,330
Mercedes	21,588	22,221
Atlantic	19,933	20,350
Sinclair	11,263	11,309
Pantepec	10,793	10,408
Richmond	10,447	10,278
Phillips	6,347	5,693
British	914	968
Guasare	15	—
TOTAL	1,634,410	1,635,961

Book Review

The Financial Post Survey of Oils, Canada edition, 1951, published by Maclean-Hunter Publishing Co. Toronto, 256 pages, $2.

This annual year book reviews oil and natural gas companies, both active and inactive, with production figures, royalty data, price ranges of Canadian oil stocks and seven maps of oil and gas fields in Western Canada.

French Committee On World Congress

French participation in the Third World Petroleum Congress which is to meet at The Hague on May 28 is being arranged by a special committee of which René Navarre, general manager of the French Petroleum Institute is chairman. Acting for the Ministry of Industry and Commerce are M. Martin, chief of the fuels division and M. Moch, executive delegate of the research bureau. The oil industry is represented by Robert André, André Blanchard and Henri Dupin de Saint-Cyr, heads of the three principal trade organizations. Technologists are represented by Jean Frie, Antoine Gotard and Pierre Laurent of the technological association and by Leon Migaux of the Cie Generale de Geophysique. Two members of the board of the Petroleum Institute—Paul Dumanois and Leon Chaque—are on the committee and the University is represented by Henri Weiss. The committee has arranged for a number of papers to be presented at the Congress dealing with the subjects of exploration, drilling and production, and petroleum chemicals.

New B-A Coordinator

Appointment of O. I. Torkelsen to the newly-created position of exploration and production coordinator of The British American Oil Co. Ltd., is announced by W. K. Whiteford, president. Mr. Torkelsen's headquarters are in Toronto, Canada.

A graduate of the University of California, Mr. Torkelsen joined British American 12 years ago as field geologist. In 1946 he was made a vice-president of the producing company in charge of all production activities in the western division and in 1948 was promoted to manager of the western division.

Iran's Oil Production

Production of crude oil in Iran for the month of February is reported as 2,579,000 long tons or approximately 704,964 barrels per day. Production for the two months January-February 1951 was 5,205,000 long tons, an average of 679,900 barrels daily.

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1901-1951

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- PAN AMERICAN REFINING CORP.
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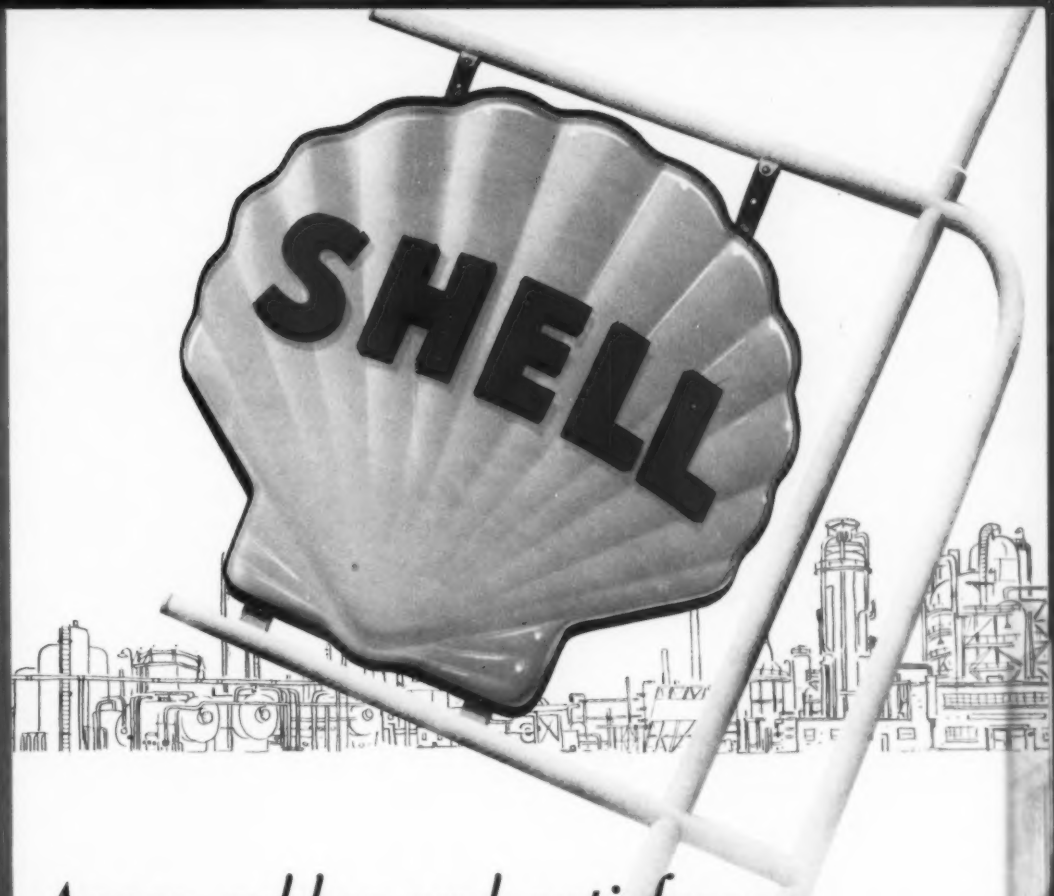
- SOCIETE GENERALE DES HUILES DE PETROLE
- SOCIETE INDUSTRIELLE BELGE DES PETROLES
- SOCONY-VACUUM FRANCAISE
- SOCONY-VACUUM OIL CO.
- E. R. SQUIBB & SONS
- STANDARD OIL CO. (INDIANA)
- STANDARD OIL CO. (OHIO)
- STANDARD OIL CO. OF CALIFORNIA
- SWIFT AND CO.
- TEXAS CO.
- UNION OIL CO. OF CALIFORNIA
- UTAH OIL REFINING CO.
- WASATCH OIL CO.
- WOOD RIVER OIL & REFINING CO.



Avgas, rubber and anti-freeze in the raw . . . for Shell!

In 1942, Kellogg undertook its first domestic process and construction work for Shell—three Fluid catalytic crackers simultaneously—two for Wood River, Illinois, and one for Dominguez, California.

This was "matched" by an assignment to build a government-owned butadiene plant—according to designs furnished by Shell Chemical, the ultimate operator—in California. During the following years, Kellogg designed and constructed dewaxing and phenol treating units for lubricating oil production in this country. In the early thirties thermal cracking facilities were constructed in France for Shell's associate, Compagnie de Raffinage Shell-Berre.

Most recently, Kellogg has built major units for the production of ethyl chloride and for processing butylene glycol from diacetone alcohol at the new Lamont Deer Park plant of Shell Chemical.

THE M. W. KELLOGG COMPANY
A SUBSIDIARY OF PULLMAN INCORPORATED

for fifty years an integral part of processing history

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Portrait at

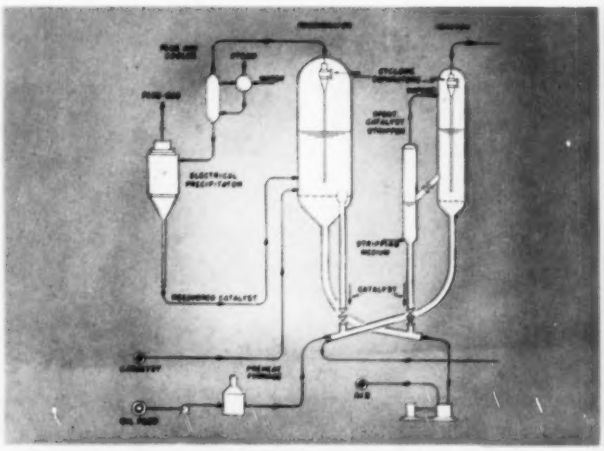
This year is Kellogg's fiftieth of service to industry. At this time naturally, as a group of men—known collectively to the modern business world as The M. W. Kellogg Company—we can think back nostalgically. We can remember the chimney stacks

"Harnessing the Specialties..."

In previous issues of this magazine, camera "portraits" of M. W. Kellogg today have highlighted the major aspects of Kellogg's widely diversified chemical, process, metallurgical and equipment development program.

This month, development work in the specialty of chemical engineering leads logically to the introduction of the fountainhead of Kellogg's service to industry—Process Engineering.

1. *FROM THE BROAD CANVAS* of Kellogg development activity, let us turn to the specifics of chemical processing—starting with the *Chemical Engineering Development Group*. The chemical unit processes and operations are its responsibility, including heat exchange, solvent separation, diffusion and the action of fluidized solids (pictured)—the latter vital to modern refinery processing.



4. *BUT ALL THIS DEVELOPMENT* work has only one end purpose: More efficient processing plants, achieved either through improved processes or improved process equipment. Thus *Process Engineering* is truly the fountainhead through which Kellogg serves industry. The Process Engineering Department is made up of men of varied talents, varied experience and varied functions.

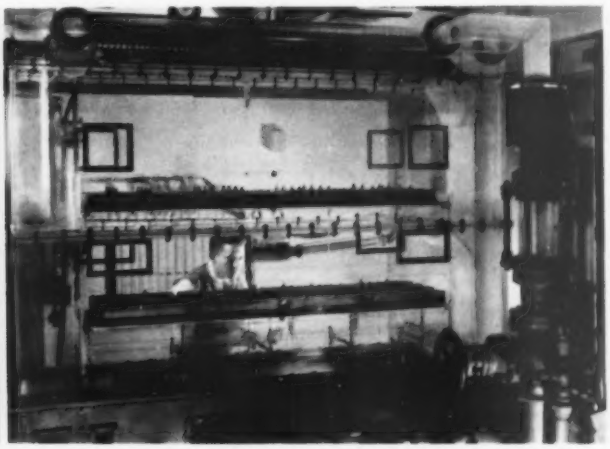
5. *FIRST TO CONTACT* any customer are those engineers charged with creating the optimum process sequence—combinations of two or more processes—to accomplish a desired industrial task. Thus, they work continually with dollars-and-cents as well as throughput, stream efficiency and product quality. These process specialists are supported in this work by a sizeable *Economics Group* which is an integral part of the department.

Fifty... no. 4

KELLOGG
1901-1951
50th Anniversary

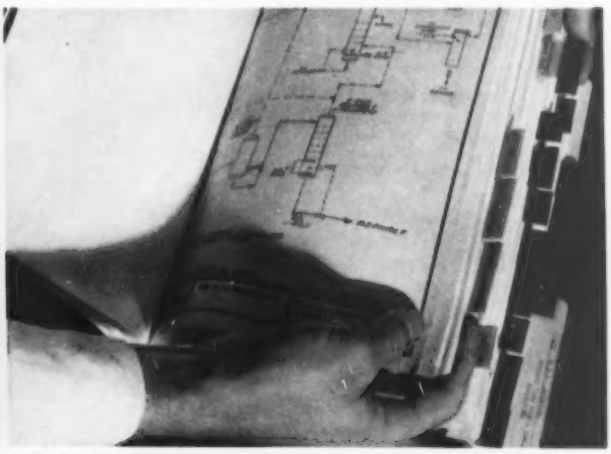
we built in 1901 . . . the first crude vessels for oil refiners in the 'teens . . . our first combination unit. The forty-odd Fluid cat crackers built in these years. But, after all, The M. W. Kellogg Company is only a factor as it is able to serve industry today. For that reason, we are presenting this series of monthly camera studies which document our belief that a truly integrated organization can better serve industry to achieve greater earning power. This is No. 4 in the series.

2. *THIS DEVELOPMENT GROUP* produces such volumes as the one pictured above. Some four inches thick, it documents three years' development effort by Chemical Engineering in the field of heat exchange alone, which has resulted in improved design of Kellogg heat exchangers. Similarly, the group has worked out liquid-vapor equilibrium constants for hydrocarbon mixtures under all manner of conditions.



3. *ANOTHER VALUABLE CONTINUING STUDY* by the chemical development engineers concerns the "fluidynamics" of fractionating towers, pointing toward more efficient bubble towers of all types. These studies are constantly contributing to increased tower efficiency and may soon be responsible for the design of smaller bubble towers with as great or even greater throughput than the ones in current use.

6. *THIS ECONOMICS GROUP* carries on general industry studies as well as individual studies of specific projects. Much of the stimulation of the development people for new processes comes from this group who constantly strive to perform processing functions at lower operating costs with smaller initial investments . . . and to obtain simultaneously improved yield and quality of products.

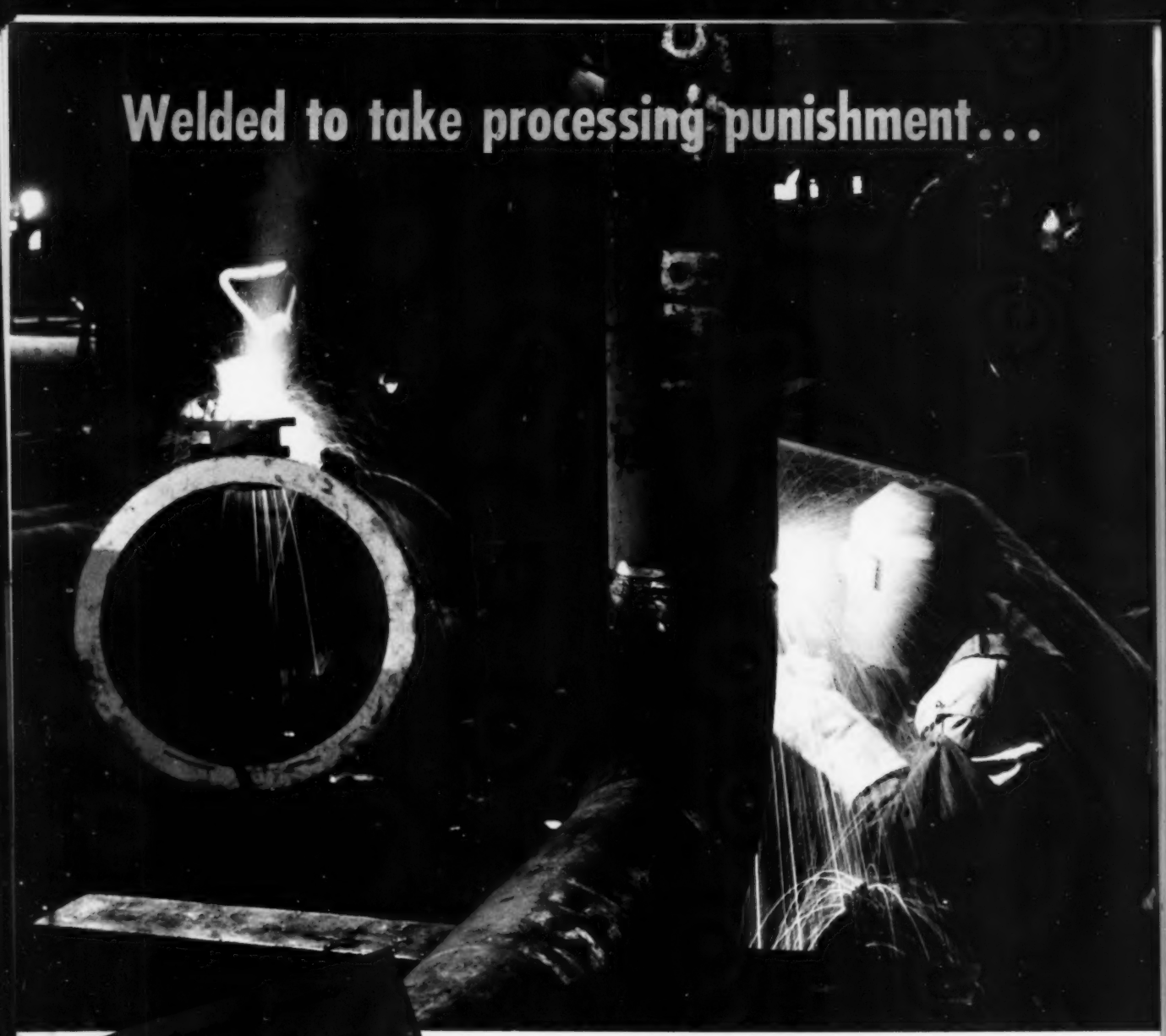


7. *BACK OF THESE* two groups are the *Process-Unit Engineers*—each group specializing in a particular process or type of processing. These engineers "live" with their particular process, devote their entire time to its improvement. These are the engineers who prepare for all Kellogg projects, the detailed process designs, flowsheets, etc., which are incorporated into Process Data Books, like the one shown here.

NEXT MONTH

. . . in the fifth in this series of camera studies of M. W. Kellogg today . . . you will see how Kellogg handles "Details by the Million" in the important phase of Design Engineering.

Welded to take processing punishment...



M. W. KELLOGG

For catalyst lines a man can walk through . . . for process piping that will exclude a mouse, Kellogg's exclusive fabricating techniques — bending, welding and stress relieving — produce piping that has appreciably longer service life in punishing process applications.

Special Studies of unusual problems such as stress corrosion and graphitization to assure long life and low maintenance.

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Canadian Kellogg Company has established complete shop facilities for the fabrication of all types of piping at **EDMONTON** in Alberta Province. Inquire directly or through any Kellogg office.

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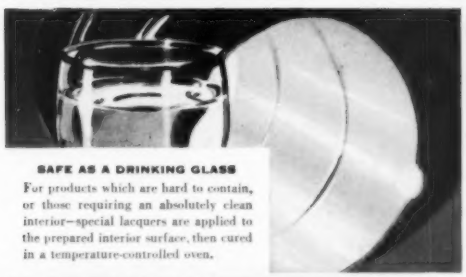

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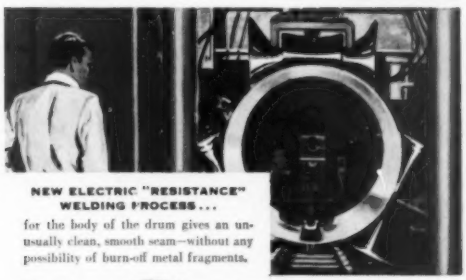
For products which are hard to contain, or those requiring an absolutely clean interior—special lacquers are applied to the prepared interior surface, then cured in a temperature-controlled oven.

ROLLER-COATING OPERATION...

applies the base coat to the steel surface, assuring positive adhesion for utmost resistance against weather and handling.



NEW ELECTRIC "RESISTANCE" WELDING PROCESS...

for the body of the drum gives an unusually clean, smooth seam—without any possibility of burn-off metal fragments.

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Oil company staff changes

C. Allan Braun

C. ALLAN BRAUN was recently named comptroller for C. F. Braun & Co. of Alhambra, Calif. During his 18 years with the company, Mr. Braun has filled many responsible posts. Among the departments he has managed are purchasing, estimating, communications and publicity. Early this year Mr. Braun took over many of the responsibilities of comptroller, as assistant on financial controls. Now, in addition to his new duties as comptroller, Mr. Braun will act as budget-director and coordinator of financial systems and procedures for the 60-million-dollar-a-year concern.

LOWELL A. KERN has joined the headquarters staff of the American Petroleum Institute to handle agricultural services. He came to the API from Swift & Co., where he had been in charge of that company's agricultural information program.

Ladd Haystead, nationally known agricultural editor and writer, will continue as counselor on agriculture to the API.

JOHN W. DAKER'S appointment as assistant vice president in the marketing department has been announced by C. T. Foster, president of The Standard Oil Co. (Ohio) following action of the board of directors. Creation of the new post is occasioned by the expansion of Sohio's sales activities to meet the increasing demands for petroleum products in Ohio.

RALPH O. RHOADES has been appointed to the newly created position of executive assistant to the vice president on the staff of the production department of Gulf Oil Corp. in Pittsburgh. Mr. Rhoades joined Gulf in 1926 as a geologist in South America. Subsequently he served in the Middle and Far East and in Europe. In 1939 he was assigned to Gulf's London Office and was transferred to Pittsburgh in 1940. He was staff geologist and chief of the land and exploration branch before his newest appointment.

B. F. Hake has been appointed chief of the land and exploration department to succeed Mr. Rhoades. Mr. Hake joined Gulf in 1934, doing field and sub-surface geology and petroleum engineering in Michigan, and subsequently was in charge of the company's geological operations in eastern United States until he entered the Corps of Engineers, U. S. Army, in 1942. He rejoined Gulf in October 1945.

BARNEY C. McCASLAND, JR., has been appointed district geologist for Cities Service Oil Co. at Olney, Ill. For the past four and a half years he has been on the Cities Service Oil Co. geological staff at Jackson, Miss.

Dr. Karl V. Kitzmiller

DR. KARL V. KITZMILLER has been appointed associate medical director of Ethyl Corp. He will direct the medical work of the corporation and act in a supervisory and advisory capacity on medical problems of the sales, research and manufacturing departments, relieving Dr. Robert A. Kehoe, medical director, of all duties possible in Ethyl's health and safety operations. Dr. Kitzmiller joined Ethyl's medical department in 1926, was named medical supervisor in 1942 and assistant medical director in 1946.

C. A. SWIGART has been elected president of Trans-Arabian Pipe Line Co. to succeed B. E. Hull. Mr. Swigart will also serve as a director and will have headquarters in Beirut, Lebanon. A graduate of Leland Stanford University, he has been vice president of Tapline since 1949. His earlier experience included service as a pipe line engineer, project supervisor, and pipe line department manager for Standard Oil Co. of Calif.

DR. KENNETH K. KEARBY has been appointed a senior research associate of Standard Oil Development Co. in recognition of his achievements in the chemistry of synthetic rubber and high octane gasoline. Dr. Kearby's promotion is in line with the company's policy of conferring professional titles upon employees who have rendered outstanding service in technical fields. He has been associated with Standard Oil Development since 1937.

Dr. Kenneth K. Kearby

SAM L. JACKSON, assistant chief engineer at Service Pipe Line Co., has been appointed assistant manager of the products pipe line department of Standard Oil Co. (Ind.). Mr. Jackson joined Service as an engineer's helper. He became assistant chief engineer in 1947.

JOHN HUDSON has been appointed personnel and safety supervisor of Southern Geophysical Co. in Fort Worth, Texas, Dr. Sidon Harris, president of Southern, has announced. Mr. Hudson will direct the recruiting program for the company's fourteen crews and Fort Worth and Midland offices. He has been in the oil industry for the past 20 years in the United States and Mexico. During World War II he was with the U. S. Marine Corps in the Pacific.

FRANK A. MORGAN, Los Angeles, vice president and manager of exploration of Richfield Oil Corp., has been elected national president of the American Association of Petroleum Geologists. Mr. Morgan has been active in oil exploration work throughout the western United States for the last 30 years. He has been closely identified with the discovery and development of many of California's great oil fields, including the Cuyama valley district.

Other new officers are Lewis G. Weeks, New York, chief research geologist, Standard Oil Co. (NJ) vice president; Robert H. Dott, director Oklahoma Geological Survey, Norman, Okla., secretary-treasurer; and Kenneth K. Landes, professor, department of geology, University of Michigan, editor. The new officers will take their posts at the group's annual meeting in St. Louis in April.

CHESTER A. BISHOP, for the past 25 years actively engaged in the marine business on the Pacific, Gulf and East coasts, has been made marine sales manager of the Socony Paint Products Co., Metuchen, N. J. He was marine salesman for the company in the New York metropolitan area.

WILLIAM P. GEE, vice president of Texaco Development Corp., has been promoted to assistant to the president of The Texas Company. Mr. Gee entered the oil business in 1919, and was first employed by Texaco in 1927 as a research chemist in the Port Arthur, Texas, refinery. He has been actively engaged in the development and commercialization of many of the processes licensed by The Texas Co., which are widely used in the petroleum industry throughout the world.

William P. Gee

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Program of Events

(Continued from page 49)

Deputy rapporteurs: Dr. H. VAN DRIEL, Royal Dutch/Shell, Lab., Delft.
K. VAN NES, Royal Dutch/Shell Lab., Amsterdam.

SECTION 7: Utilization of Oil Products

1. Fuels and Combustion.
2. Natural and liquid gas.
3. Engine Fuels.
   a. Gasolines.
   b. Diesel Fuels.
   c. Turbine Fuels.
4. Heating Fuels.
5. Lubricants and Lubrication.
6. Motor Oils.
7. Industrial Lubricants.
8. Asphalts and Bitumens.
9. Special Products.

Rapporteur: Professor J. J. BROEZE, Technical University, Delft, Director Royal Dutch/Shell Lab., Delft.
Deputy rapporteurs: B. H. MOERBEEK, Royal Dutch/Shell, The Hague.
Dr. C. WEBBER, Royal Dutch/Shell, The Hague.

SECTION 8: Construction of Equipment: Materials, Corrosion

a) CONSTRUCTION OF EQUIPMENT (excl. drilling and prod. equipment).
1. Equipment for refineries.
2. Equipment for chemical factories.
3. High pressure equipment.
4. Safety equipment.
5. Standardization.

b) MATERIALS, CORROSION.

Rapporteur: H. V. D. HOEVEN, Royal Dutch/Shell, The Hague.
Deputy rapporteur: M. L. KALFF, Royal Dutch/Shell, The Hague.

SECTION 9: Transport, Storage and Distribution

1. Pipelines and pumps.
2. Tankers.
3. Bulk storage.
4. Transport by rail and road.
5. Small Containers (drums, etc.).
6. Service stations.

Rapporteur: N. TH. KOOMANS, President, Port of Rotterdam Authority.
Deputy rapporteurs: F. J. MANS, Royal Dutch/Shell, The Hague.
J. S. PEL, Van Ommeren's Shipping Company, Rotterdam.

SECTION 10: Economics and Statistics; Documentation; Education and Training.

a) ECONOMICS AND STATISTICS.
1. Economics.
2. Legislation.
3. Statistics.

b) DOCUMENTATION.
c) EDUCATION AND TRAINING.

Rapporteur: F. DONKER DUYVIS, Patent Office, The Hague, Secr.-Gén. Féd. Int. de Documentation.
Deputy rapporteurs: Dr. H. B. J. SCHURINK, Royal Dutch/Shell, The Hague.
J. J. VENHUIZEN, Royal Dutch/Shell, The Hague

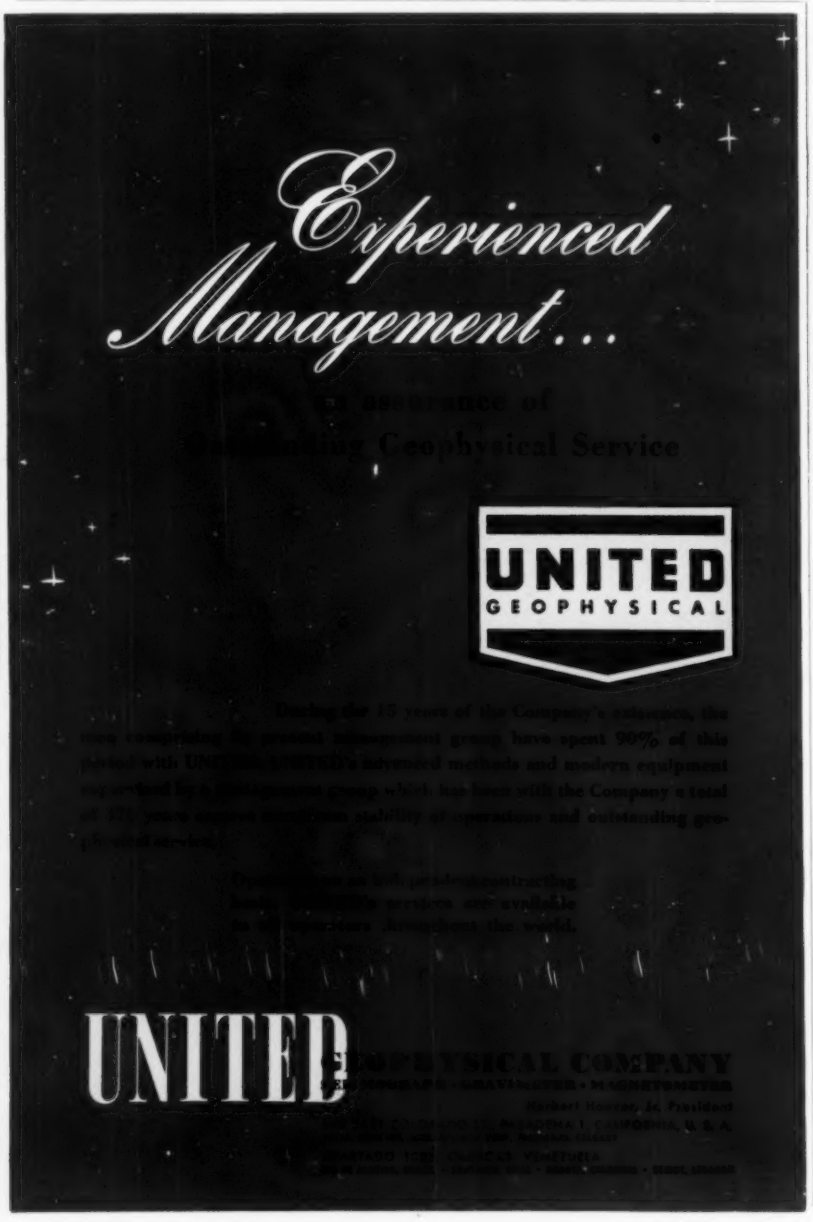
Papers to be presented at the Congress and attendant discussions are grouped in ten master sections according to their subject matter. Master Section No. 1 has on its agenda ten groups of topics to be dealt with in seven meetings, all relating to geology and geophysics. Seven of these are devoted to geological conditions in particular areas as follows: France, Morocco and Germany; Far East and Caribbean; United States and Canada; Venezuela; Middle East; Mexico; Italy. Seven papers are to be presented on paleontology and sedimentation; five will deal with the origin and migration of oil. Under the broad heading of geophysics there will be theoretical papers, reports on gravimetric, magnetic and electrical methods and a review of recent developments in seismic and other methods. A joint meeting of Section 1 and 2 will hear reports on subsurface geology in the United States, Canada and Venezuela.

Master Section 2 will discuss the many phases of drilling and production techniques, drilling fluids, well logging devices, laboratory investigations and reservoir engineering. A review of all aspects of secondary recovery by fluid injection will be discussed at the final meeting.

Physical operations in oil processing will provide the theme for Section 3. Physicists from a half dozen or more countries will discuss highly technical phases of vapor-liquid equilibria, distillation, and extraction, adsorption, crystallization and related topics.

Section 4 which has for its general classification "Oil Processes Involving Chemical Conversions" will deal with this broad subject through four subsections. The first of

(Please turn to page 92)



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Two years ago, for instance, Socony-Vacuum spent $158,000,000 for oil exploration, advanced research, new pipelines, tankers, refinery and storage facilities — to help fill U.S.A.'s yearly demand for 2,080,000,000 barrels of petroleum.

And we still have a big job ahead!

The Nation's needs for Security—*your* demands for a big money's worth in oil for homes, transportation, industry and farms all must and *will* be met.

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SOCONY-VACUUM

DEMAND DETERMINES BIGNESS

The Flying Red Horse Companies: SOCONY-VACUUM OIL COMPANY, INC., and Affiliates:

MAGNOLIA PETROLEUM COMPANY • GENERAL PETROLEUM CORPORATION

these will take up for consideration the Fischer-Tropsch process and the various modifications adopted in different countries, following this with a review of high pressure hydrogenation and its results.

Another subdivision of Section 4 will direct its attention to catalytic and thermal cracking and reforming. Papers will be presented by members of the technical staffs of Houdry Process Corp., Socony-Vacuum, Shell and Imperial Oil companies. These papers, describing methods and processes independently worked out by leading research organizations and dealing with matters of widespread interest, are expected to attract much attention.

A third subsection of Section 4 will hear discussions of polymerization, alkylation and isomerization. The "Platforming" process developed by Universal Oil Products Co. will be described in detail and a spokesman for Standard Oil Development Co. will tell of its application of the fluid technique to the hydroforming process. Two papers, one by Universal Oil Products Co. and the other by California Research Corp., will deal with the conversion of light olefins into high octane gasolines by catalytic polymerization.

A fourth subsection of Section 4 will devote itself to chemical treating processes and specifically to the removal of sulphur from crude by various treatments.

Master Section 5 will concern itself with the production of chemicals from petroleum. This is a field in which great advances have been made in recent years and are still taking place. The synthesis of various chemicals and especially the production of detergents and biocides will be discussed in detail. The general heading of the composition of petroleum, its analysis and treatment, measurement and control which is the subject matter before Section 6 has attracted a large number of papers. The great interest of oil chemists in the constitution of petroleum, and in the study of hydrocarbons is indicated by the number of contributions pertaining to these subjects.

The utilization of oil products covers such a wide range of topics that its consideration has been divided into several sub-heads. Aside from the fundamentals of combustion topics to be discussed include the following: natural and liquid gas; gas turbines and their fuels; gasoline engines; diesel engines; heating fuels; motor oils; industrial and special lubricants; asphalts, bitumens and electrical oils.

Section 8 will review the construction and maintenance of equipment, aside from that employed in drilling and production. It will consider questions of water supply and cooling, corrosion, cathodic protection of pipe lines, fire protection, pressure problems and the general subject of standardization of equipment.

Another section provided for in the program is related to transport, storage and distribution. For this section, sixteen papers have been prepared relating to pipe lines and drum making, oil measurement, tankers and harbor facilities.

Finally the section on economics and statistics will have four subdivisions under the headings of documentation and classification, legislation, training and economics.

While the papers to be presented before the Congress and the sectional meetings to be held are too numerous to permit individual members to cover them all, the arrangement adopted and the classification of subjects on which the various sections are to deliberate enables each member to concentrate attention on the matters in which he is most directly interested and thereby to gain the maximum benefit from his attendance at the Congress.

Sinclair Research Organization

Formation of Sinclair Research Laboratories, Inc. and election of directors and officers of the new, wholly-owned subsidiary of Sinclair Oil Corp. is announced by P. C. Spencer, president of the parent company. The new company will take over all the research activities of the Sinclair companies, including the extensive laboratories at Harvey, Illinois.

Officers are: E. W. Isom, chairman of the board; P. C. Spencer, president; W. M. Flowers, executive vice president, and E. C. Herthel, vice president. Named as directors were: W. R. Argyle, W. M. Flowers, E. C. Herthel, E. L. Hughes, E. W. Isom, T. B. Kimball, W. H. Morris, H. L. Phillips and P. C. Spencer.

Mexican Pipe Line Completed

Petroleos Mexicanos has announced completion of the pipe line across the Isthmus of Tehauntepec from Salina Cruz in the State of Taxaca to Coatzacoalco in Vera Cruz. The line extends from the Pacific Coast to the Gulf of Mexico and does away with the necessity of using the Panama Canal in moving oil products from the producing areas in the east to the oil-isolated west coast. It is considered an important factor in hemispheric defense.

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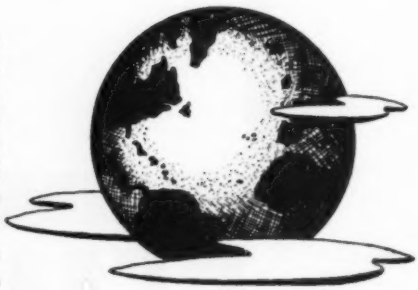

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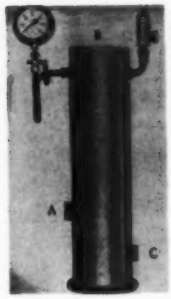
British Equipment

(Continued from page 80)

one, two, three or four drums, as required, gravity wedge action locks them securely in position. In order to release the drums, positive oil pressure is required and this is drawn from the hydraulic system of the truck, being controlled by a special valve. Since the drums are held in position by gravity they cannot fall, even if there should be a failure in the hydraulic system. Variations in the diameter of the drums up to two inches are allowed for, and in height up to six inches. While the standard drum carrier has a capacity of four drums, two-drum models are also available. The method of stacking allows pallets to be dispensed with, and ensures rapid handling by one operator only.

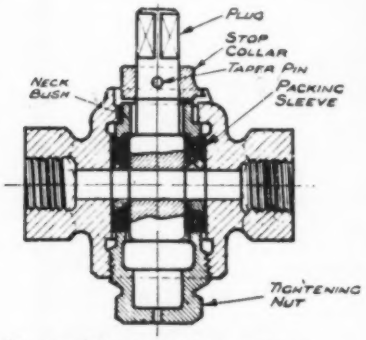
Steam (and Heat) Saving Devices



Important savings of fuel can be effected in refineries by recovering the heat where thousands of pounds of condensate per hour are flashed from evaporators and other vessels at high pressures. Spirax Manufacturing Co., Cheltenham, specialists in steam saving and particularly in the recovery of steam condensate, point out that where considerable back pressures are involved, or where operating steam pressures are low, a simple automatic pump of the Spirax "Ogden" type is necessary. Another specialty is the Spirax flash vessel shown in the accompanying illustration. Condensate from steam traps on high pressure units enters at "A"; the flash steam separates from the condensate and passes out through "B" which is connected to the low-pressure process equipment. The residue of condensate (still hot) is discharged through a Spirax Ball-Float steam trap at "C" for return as boiler feed water. This simple apparatus is a first class aid to economy.

Sleeve Packed Cocks

All refineries have long used a multitude of small grooved asbestos packed cocks that showed little change in design. This situation changed when Richard Klinger, Ltd., produced their "sleeve-packed" product for replacing taper plug cocks for pressure gauges, air reliefs, drains, instrument connections, gas controls, etc. The packing consists of a renewable sleeve of compressed asbestos which is inserted in the body as a single unit. The plug is perfectly parallel and is ground to size, so that there is no risk of the cock jamming when it is tightened up. The renewable packing sleeve is made from resilient Klingerit compressed asbestos, and is built up in layers. A ridge on one side of the sleeve fits into a corresponding groove in the body, and ensures that the ports are always in line.



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Send for File No. 659. You will receive our latest catalog, a Periodic Inspection Record Chart, "Fundamentals of Fire Extinguishment" and information about Ansul Dry Chemical Piped Systems for automatic protection.
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Spirax Letters - No. 4

Power or Process or both?

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Is your steam needed for power or for process or both? If both, then it is wrong to think in terms of process steam being a by-product of power. The highest overall thermal efficiency is possible only the other way round; by producing power as a by-product of process steam. (When process steam is first passed through an engine or turbine, power can be generated with as little as two-fifths of the coal used by the most efficient condensing power plant.)

Whether you use steam for power and process or for process only, efficiency requires (a) that process plant has adequate heating surfaces so that steam can be used at the lowest practicable pressures; (b) that heat transfer from the steam is at the highest practicable rate; (c) that any residue of heat from the steam is given work to do.

We propose to explore these matters step by step, starting (in our next Letter) at the boiler stop-valve.

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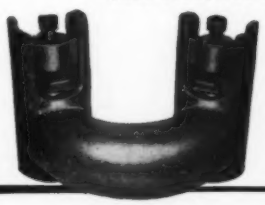

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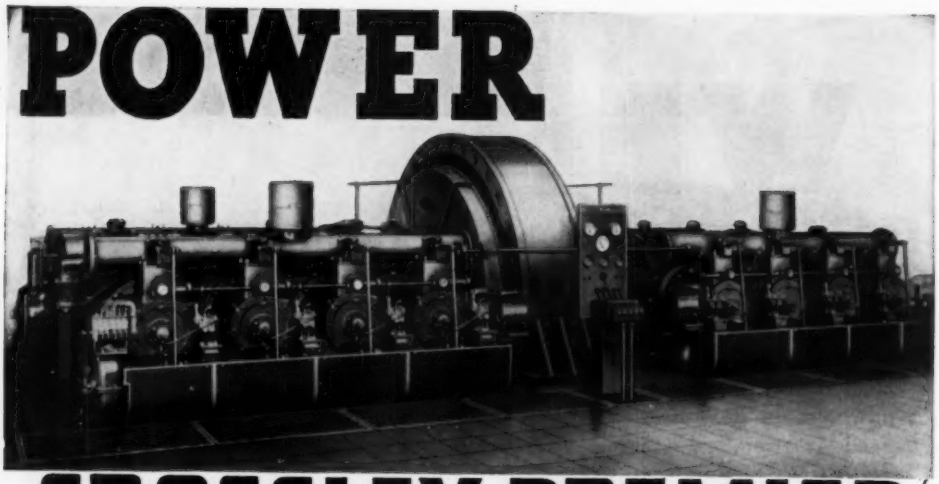

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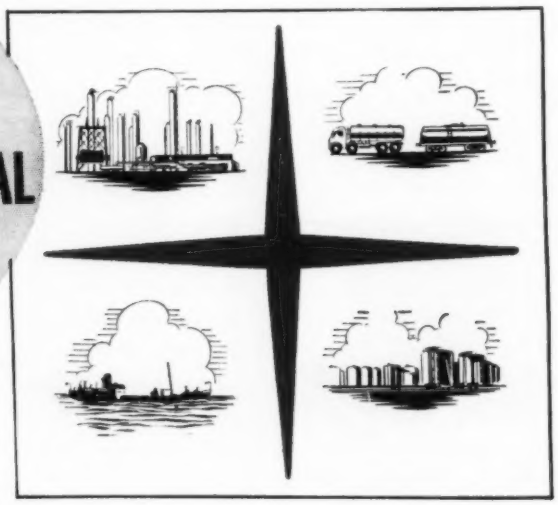

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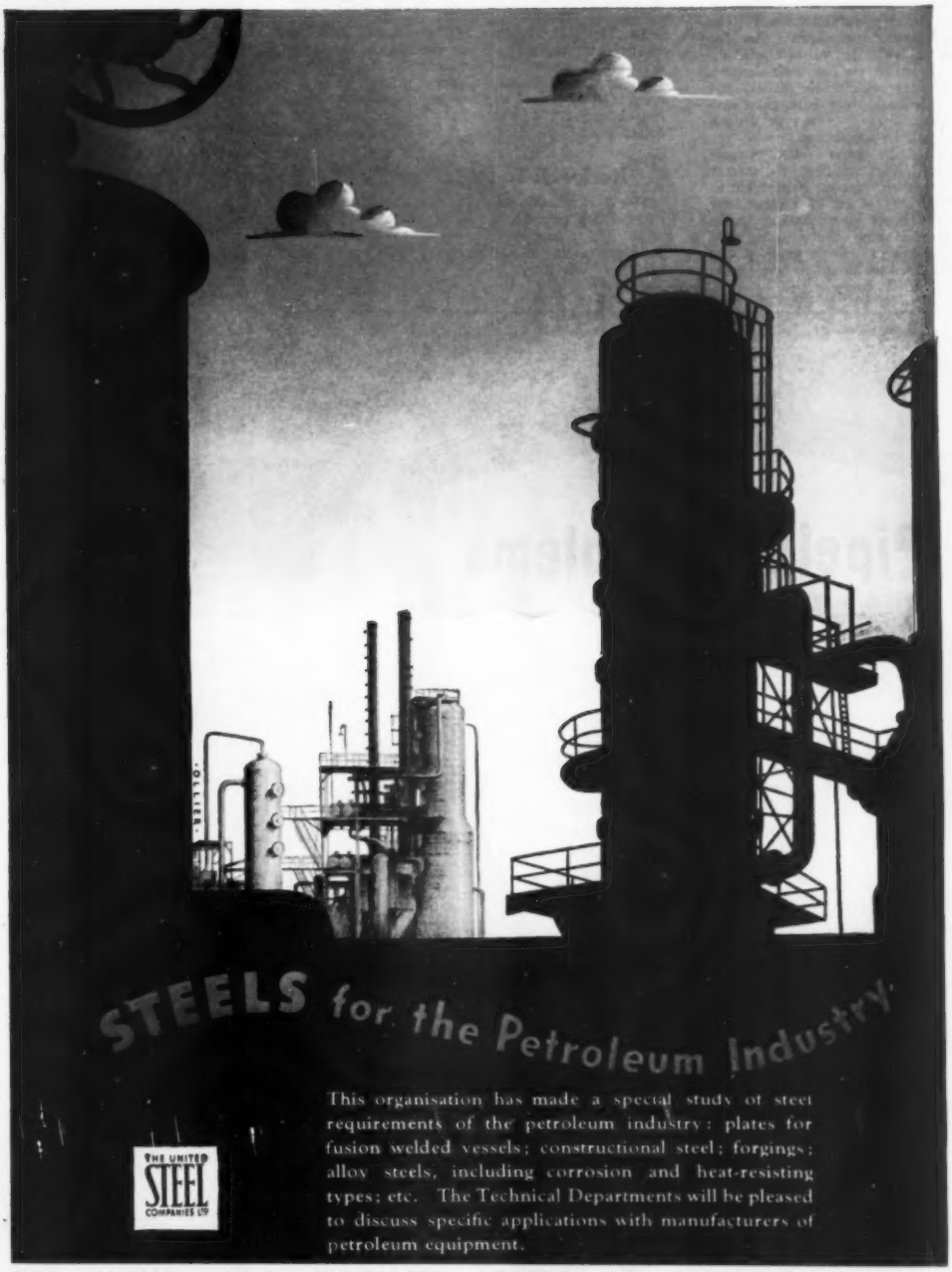

This organisation has made a special study of steel requirements of the petroleum industry: plates for fusion welded vessels; constructional steel; forgings; alloy steels, including corrosion and heat-resisting types; etc. The Technical Departments will be pleased to discuss specific applications with manufacturers of petroleum equipment.

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Shell Demonstrates New Type Drum

A new type steel drum, designed to save warehouse space, speed handling, and cut transportation costs, was demonstrated for the first time recently by the Shell Oil Co. before members of the Petroleum Packaging Committee and representatives of the military establishment. The new drum is slightly taller and slimmer than the standard type now in use. Its "tailor-made" dimensions permit it to be loaded four-abreast, double-decked in the average truck trailer, and five-abreast, double-decked in box cars, thus saving considerable space over present-type drums. Similar saving is made in warehouse space.

A unique feature of the drum is its "necked-in" head, about two inches smaller in diameter than the rest of the drum, making it possible to stack the new drums one on top of another, the necked-in top of the lower drum fitting inside the bottom rim of the drum above. The new drums eliminate the use of pallets as they can be lifted, two-high, by the modified fork-truck, and set directly into the car without individual handling. Besides speeding handling and eliminating the original cost of the pallets the new method saves freight charges.

Calco Appoints Engineering Director

Dr. Victor E. Wellman has been named director of process engineering of the Calco chemical division of American Cyanamid Co. In his new capacity, Dr. Wellman will direct process development and chemical engineering activities which have been merged to form the process engineering department.

Rockwell To Build New Plant

The Rockwell Manufacturing Co. of Pittsburgh will build a new manufacturing plant in Tupelo, Miss. The company now operates 14 plants to build such items as valves, meters and regulators for the oil industry.

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Andrew Kalitinsky

Heads Special Products Dept.

Andrew Kalitinsky, former chief engineer of the NEPA (Nuclear Energy for Propulsion of Aircraft) Project, has been appointed by The M. W. Kellogg Co., refinery and chemical engineers of New York, as manager of the company's special project department. This department is playing an increasingly important part in research and development of rockets and rocket motors for the U. S. Air Force and Navy.

Mr. Kalitinsky was educated at the Swiss Federal Institute in Zurich. On coming to the United States, he joined the staff of the Massachusetts Institute of Technology and later engaged in development work with Pratt & Whitney. He was with the United States Navy Bureau of Aeronautics during the war, before joining Fairchild Engine and Aircraft Co. to head the NEPA Project. He is at present a consultant to the U. S. Airforce.

His work at Kellogg is a continuation of his specialization in the field of propulsion. The company is engaged in development work on rockets and rocket fuels in its special projects department, and is manufacturing rockets employing both solid and liquid fuels.

Worthington Appoints Export Manager

J. J. Llanso has been appointed general export manager of Worthington Pump and Machinery Corp. He formerly was a vice president and manager of Worthington Ltd., Buenos Aires, Argentina. He has been with the Worthington export department in South America since 1929. He was resident engineer, first in Buenos Aires from 1936 to 1942, and later in Lima, Peru, from 1944 to 1945. He then became acting manager of Worthington de Brasil, Ltd., Rio de Janeiro, until 1946 when he returned to the Buenos Aires office.

J. J. Llanso

The OIL DRILLER *and the* Ph. D.

Thousands of people must combine hundreds of skills to bring you a single gallon of Sinclair gas or quart of Sinclair oil.

There's the Ph.D. at our laboratories in Harvey, Illinois, who took his degree in the higher regions of chemistry and engineering. His job: to figure out in advance whether a given project in petroleum research will provide a new and better product and pay off in dollars and cents.

. . . And the oil well driller, who gets crude oil out of the ground. A "doctor" of many trades, he has to be carpenter, fireman and electrician as well as cable-tool and rotary drill operator.

Then there are land-leasers, geophysicists, rig builders, pipeliners, railroaders, sea captains, engineers, stillmen, chemists, salesmen, and many, many more. In all, Sinclair has over 20,000 employees with about 400 different skills.

Together, these people give Sinclair first hand knowledge of every phase of the petroleum business, from oil-discovery to marketing. Their combined, broad knowledge is another reason for Sinclair's leadership in the petroleum industry.

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Cooper-Bessemer Adds To Sales Staff

The Cooper-Bessemer Corp. has appointed Grant C. Woodard to assist C. J. Michelson who represents Cooper-Bessemer in the territories of Michigan, Ohio, West Virginia, Kentucky and Tennessee. Mr. Woodard has been undergoing extensive sales engineering training for several years at Cooper-Bessemer's Mt. Vernon, Ohio, plant.

Changes Company Name

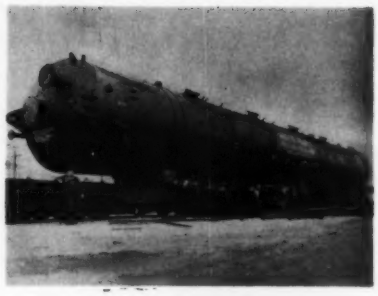
Manufacturers of Gama asbestos pipe line felt have changed corporate name from Gama Industries, Inc., to Nicolet Industries, Inc. The asbestos fiber mines in Canada have always carried the name Nicolet Asbestos Mines, Ltd., and it was decided to adopt this name for the product. Distributor for Nicolet asbestos pipe line felt is Middle West Coating and Supply Co., Tulsa.

Oil Center Tool Sales Changes

Two changes in the Oil Center Tool Co. sales organization have been announced by Rex Galloup, sales manager. A. M. Taylor, formerly with Bethlehem Supply Co. in Oklahoma, has been added to the sales organization and will make his headquarters in Oklahoma City. C. B. Wright, formerly in the Oklahoma City sales office, has moved to Dallas and will serve the North Texas territory from his Dallas headquarters.

Kuwait Output Less In February

According to information supplied by Gulf Oil Corp. on behalf of Kuwait Oil Co. Ltd. crude production in the Sheikdom of Kuwait during the month of February 1951 was 1,357,545 long tons or roundly 373,325 barrels daily. This was 410,263 tons less than in the preceding month but 342,481 tons greater than in February 1950. Variations in tanker nominations are given as the reason for the drop in February production.



Ships Mammoth Tower

Pictured here is the heaviest single railroad shipment ever made from Houston, Texas, as well as the heaviest piece of petroleum refinery equipment ever shipped by rail anywhere. It is a 49-tray depropanizer, 13 feet four inches in diameter by 120 feet long, weighing 601,236 pounds. It was fabricated in the Houston plant of Wyatt Metal & Boiler Works.

In order to successfully handle this cargo of more than 300 tons, two specially built, heavy duty railroad cars were brought into Houston. The middle car served as an idler to take care of trackage curves. To insure a successful voyage the M. K. & T. Railroad's engineering department checked all bridges along the route for clearance and strength.

Max B. Miller Dies

Max B. Miller, president of the Max B. Miller Co. of New York and widely known throughout the oil industry, died on Mar. 31. He developed special processes for the manufacture of lubricants and built many lubricating oil plants in the United States and other countries. During World War II he was chief construction engineer for the Petroleum Administration for War and directed the building of many war plants.

Electronic Combustion Safeguard

A new electronic combustion safeguard system for commercial oil burners, which provides immediate cut-off of fuel in case of failure, has been announced by General Electric's control divisions. According to G-E engineers, the system assures positive protection against combustion failure because (1) if the gas pilot does not ignite, the oil valve cannot open, and (2) if the oil flame does not ignite, the supply of fuel is cut off. After the cut-off, the motor continues to operate for 30 seconds to purge the nozzle or cup of unburned fuel to prevent carbonizing and reduce field servicing. The system is then locked against further operation until manually reset.

Book Review

Petroleum Geology, by Kenneth K. Landes; published 1951 by John Wiley and Sons, Inc. New York, 660 pages, $10.

This is pre-eminently a text for persons pursuing studies in petroleum geology either in or out of an engineering college. For such persons the author has provided a well balanced work on the three divisions of the subject: the geological conditions that gave origin to accumulations of hydrocarbons, the geographic occurrence or distribution of these accumulations, and the methods and techniques of searching for oil and gas. This reviewer has not come across a comparable work that knits these fundamentals of oil production as well. The review of fact and theory of oil formation and accumulation of oil is well informed and very readable, and is illustrated by numerous examples of type structures and reservoirs. The geographic distribution of oil is brought up to July 1, 1950. In the treatment of methods of searching for oil none of the significant procedures has been left out. Being a professor of geology, the author underscores, with justification, the value of surface and subsurface geologic studies which some have a tendency to neglect or depreciate. It is a first class book of its kind. May be ordered through the WORLD PETROLEUM Book Dept., 2 West 45th St., New York 19.

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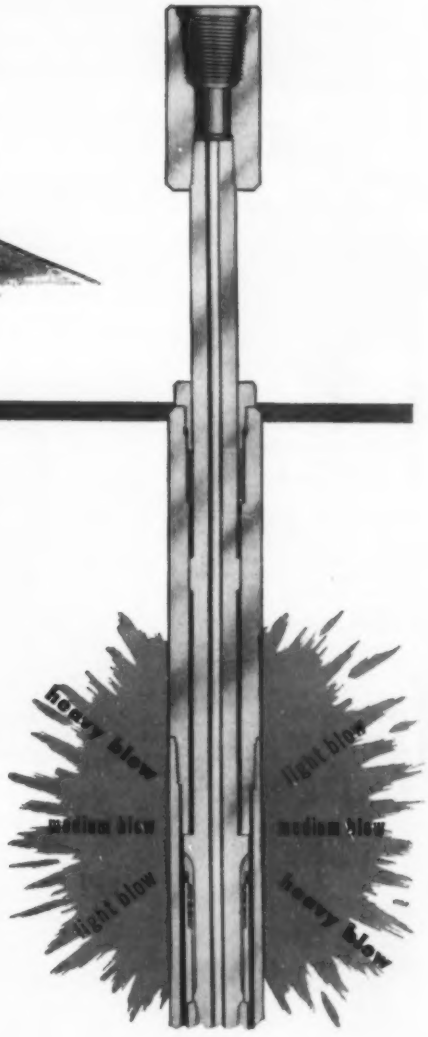

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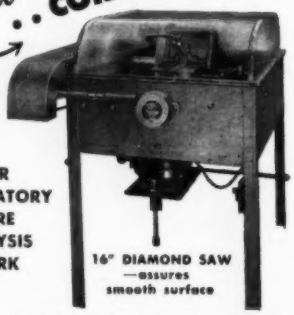

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J. Richard Phares

Phares Directs Braun Publicity

J. Richard Phares, senior designer and technical writer, has been named publicity manager for C. F. Braun & Co. of Alhambra, Calif. Mr. Phares has been with the engineering-company for 15 years.

Youngstown Sales Promotions

Paul B. Baird of Youngstown has been advanced to manager of standard pipe sales for The Youngstown Sheet and Tube Co. He succeeds Glenn W. Christopher who died recently. Carl T. Selander of Chicago, western representative for standard pipe products for the past year, has been promoted to assistant manager of standard pipe sales with headquarters in Chicago.

Jim Witovec

Named VP of Oil Center Tool

Jim Witovec, who began as an apprentice machinist with Oil Center Tool Company in 1930, climaxed a career of more than 20 years with the oil equipment manufacturing company when he was elected a vice president and director. Mr. Witovec was the 12th employee hired by Oil Center. In 1945 he was named shop foreman on the first shift and was promoted to shop production superintendent in 1948.

Commander of Eagle Fleet

Capt. J. B. McCarthy has been made Commodore of Eagle Oil & Shipping Company's fleet, succeeding Capt. A. R. Hicks, who has retired. Capt. McCarthy is the first member of the Eagle fleet to rise from apprentice to Commodore Captain. He entered the marine service of the company in 1914 and reached the grade of permanent master in 1937. During the late war he commanded the S.S. "San Felix" and received the O.B.E. for his war service.

ACS Award to Schmerling

Dr. Louis Schmerling, research chemist of the Universal Oil Products Co., Chicago, will receive the $1,000 Precision Scientific Co. award in petroleum chemistry during the Cleveland session of the American Chemical Society's meeting in April. The recipient will give his award address, on "The Mechanisms of the Reactions of Aliphatic Hydrocarbons," during a technical session of the society's division of petroleum chemistry.

Dr. Schmerling was cited for his outstanding fundamental work on hydrocarbons and his explanation of the mechanism of alkylation. He was the first winner of the $3,000 Ipatieff Prize in the fields of catalysts and high pressure in 1947.

AAPG Award

Walter B. Spangler and John J. Peterson, Esso Standard geologists currently assigned to the Creole Petroleum Corp., Caripito, Venezuela, have been designated as joint winners of the AAPG President's Award for 1951. This award is made annually to the author, or authors, under 35 years of age, of the "most significant original contribution to petroleum geology" published in the monthly Bulletin of the Association during the previous year. The winning paper, entitled "Geology of Atlantic Coastal Plain in New Jersey, Delaware, Maryland, and Virginia," was published in the January, 1950 issue of the Bulletin. Presentation of the award was made at the joint annual meeting of the American Association of Petroleum Geologists, the Society of Economic Paleontologists and Mineralogists, and the Society of Exploration Geophysicists, held in St. Louis in April.

Westinghouse Vice President

Mark W. Cresap, Jr., management consultant, has joined Westinghouse Electric Corp., Pittsburgh, Pa., as vice president and assistant to president Gwilym A. Price. The announcement of Mr. Cresap's election as a vice president was made by Mr. Price following the March meeting of directors.

Mr. Cresap is a co-founder of the New York and Chicago management consultant firm of Cresap, McCormick and Paget. He was born in Chicago, graduated from Williams College in 1932 and from Harvard Business School in 1934. For five years he was a management consultant in Chicago and New York. In World War II, Mr. Cresap served in the U. S. Army in Washington and in the Mediterranean and European theaters. He was a Colonel engaged in the improvement of organization and procedures in connection with Army logistics activities.

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Twenty experienced petroleum geologists and geographers from various parts of the world have contributed to this book, editorially sponsored by the American Geographical Society. Parts I and II discuss the general problems of making petroleum accessible and achieving a functional organization of the petroleum industry. Part III consists of 16 chapters on the world's petroleum regions. Part IV includes a unique statistical survey of petroleum consumption. The book contains 61 maps and diagrams, 30 tables, and 48 pages of photographs.

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The Horton tanks illustrated here prevent volumetric losses from natural gasoline and butane during standing storage. In so doing, they protect your good name.

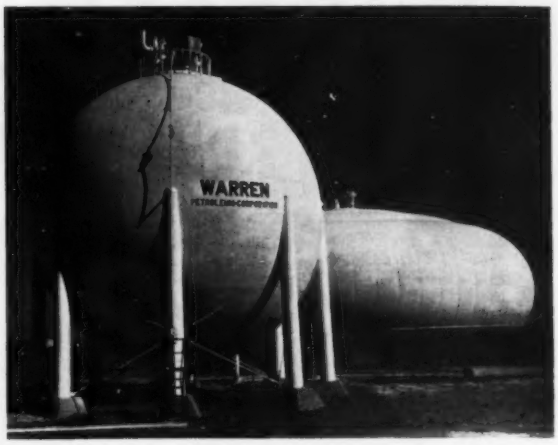
The Hortonspheroid shown below is used to store natural gasoline. This highly volatile liquid provides the easy-starting and anti-knock properties so essential in today's motor fuels. The Hortonspheroid prevents excessive venting of the light fractions that give natural gasoline most of its value as an ingredient of blended motor fuel.

The Hortonsphere shown at the right (foreground) stores butane used to maintain seasonal volatility of gasoline. It prevents the escape of butane in gaseous form—and so preserves the quantity available.

Indirectly, Hortonspheres and Hortonspheroids help keep the zip in and the knock out of motor gasoline. They're two of the many Horton structures designed specifically to protect your hydrocarbons during storage and/or processing. For finished gasoline, we build the Horton Floating Roof, Vapordome Roof and Lifter Roof to reduce evaporation losses from tanks used for standing storage and handling. Write our nearest office for details about any Horton* structure.

Both of the views on this page show Horton tanks we fabricated and erected for the Warren Petroleum Corporation at their Norsworthy terminal near Houston, Texas. The noded Hortonspheroid (below) is used to store 100,000-barrels of natural gasoline; the Hortonsphere (upper left, foreground) to store butane.*

*Trademark Registered in U.S. Patent Office.



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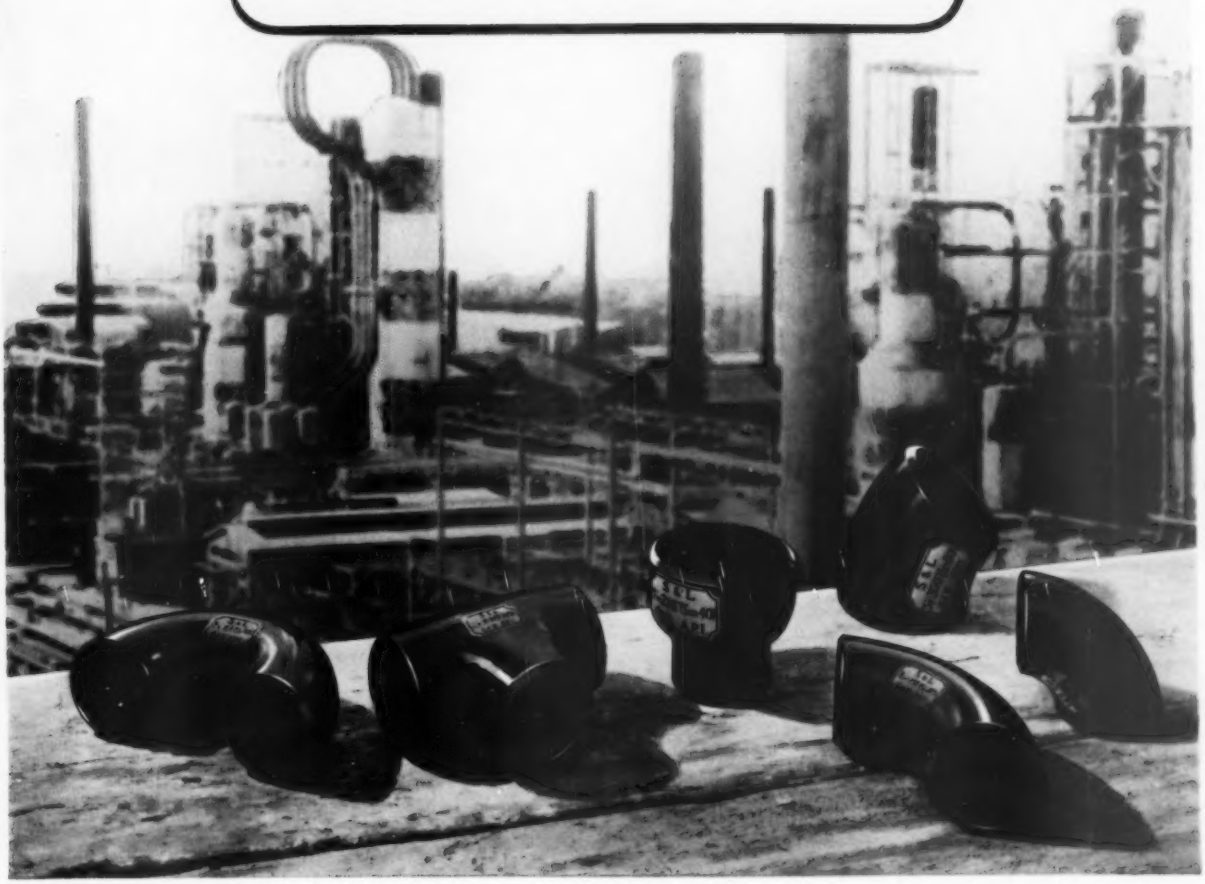

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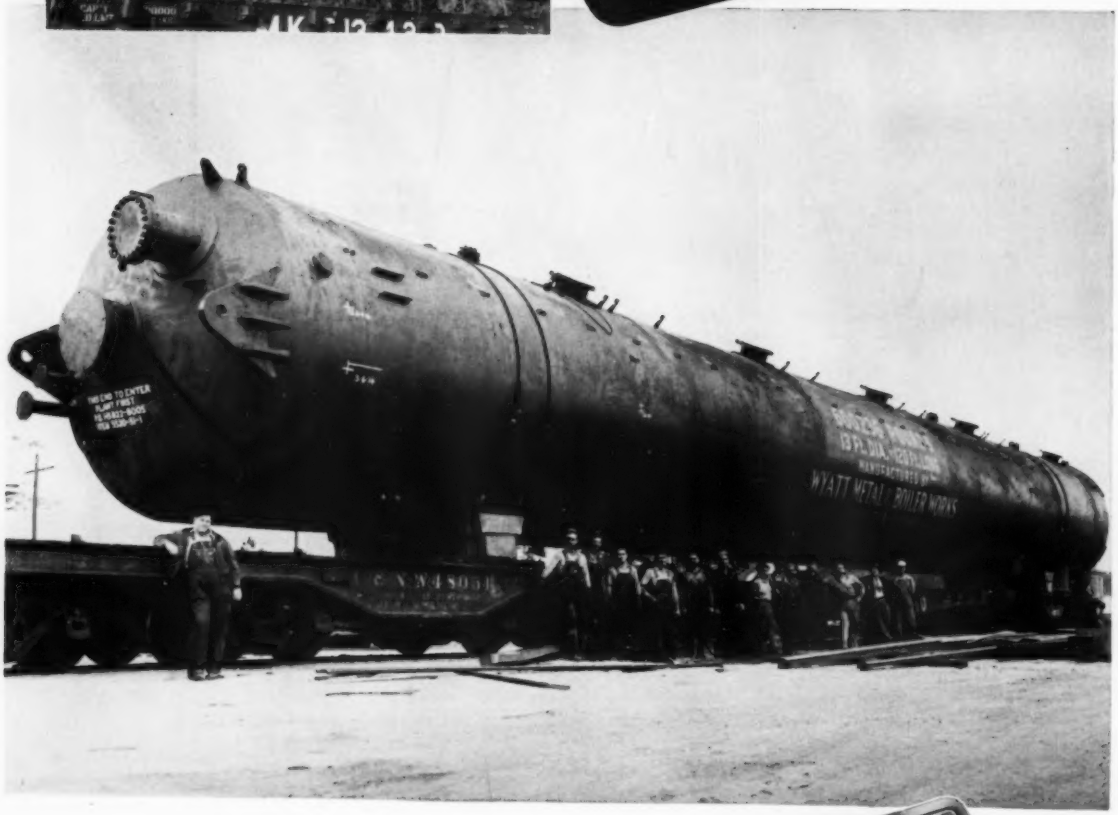

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